III. POSTRETIREMENT YEARS

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Are We Ready for the Future?

One of the most significant challenges faced by today's military forces is how to exploit fully the combat power provided by high technology weapons and equipment. One approach under study is a reorganization which exponents say would narrow the growing gap between the capabilities of new weaponry and those of the individuals and units that take it into battle.

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The U.S. Army is testing an important new organizational concept for its armored and mechanized divisions at Ft. Hood, Tex. These divisions now constitute the bulk of the Army and are the basic tactical building blocks for operations in the defense of NATO. Therefore, these tests and the decisions which flow from them could shape the Army and its capabilities for many years to come.

The reason for considering a sweeping reorganization at this time is the growing gap between the capabilities of the new high-technology weapons and the expected battlefield performance of the individuals and units into which those weapons are now being introduced. Army units in general, and forward tactical units in particular, are being inundated with technical and tactical complexity. The human material remains a relative constant. Consequently, it is important that organization and doctrine, as well as its training, exploit fully the combat power of its new weapons and equipment.

The concept of the reorganization being examined at Ft. Hood is to decentralize complexity—that is, to reduce and simplify the technical, tactical and training responsibilities at the lower echelons, and to provide more problem-solvers for the increasing number of problems. More specifically, the following changes are being considered in the Hood tests:

- Companies would be reduced in size and would specialize in single-weapon systems whether they be tank companies, infantry companies, antitank guided missile companies, or in the case of mortars, a platoon at battalion level.
- The task of coordinating the combined arms would be shifted from company back to battalion level in order to develop more available combat power on the battlefield.
- More leaders will be required to cope with and exploit the additional complexity and lethality of weapons systems and equipment. Seasoned leadership would be pushed further down and forward on the battlefield so that decentralized, quick-reacting tactical authority could outmove and outfight the more cumbersome centralized system of the Soviet Army.

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- The combat support and service support systems would be tuned to the new concept, the new weapons and their capabilities.

The net effect of reducing the size of platoons, companies and battalions, while maintaining equal numbers of weapons on the battlefield, would be to have more battalions. For example, an armored division in Europe that now has six tank battalions would have about ten.

Unsurprisingly, there is, in some quarters, only limited enthusiasm for the new organization. Many arguments have been marshaled against it. The Army has yet to make any final decisions.

Before considering the issues involved, it may be well to look back at previous reorganizations. At the beginning of World War II, under Gen. George C. Marshall's guidance, the "square" divisions of World War I (two brigades of two regiments each) were "triangularized" into a division headquarters directly commanding three regiments. One layer of command, the brigade, was eliminated.

At the same time, smaller armored divisions were formed with six maneuver battalions—three tank and three armored infantry—grouped under combat commands which were organized as flexible task forces according to need. This was a very advanced concept. The changes were consistent with the experience of the European combatants and they were ordered into effect and briskly accomplished. The smaller units were more agile and flexible and they performed well during that long and arduous war.

By the late 1950s, Gen. Maxwell D. Taylor decided to streamline the Army to meet the challenge of nuclear operations. He was somewhat driven in this direction by repeated suggestions from partisan quarters that nuclear weapons made armies obsolete and that only nuclear-delivering aircraft were useful. Even the name of the new organization, "pentomic," was a response to that aspect of the problem.

The division consisted of five big battalions called battle groups, each commanded by a full colonel. The five big maneuver companies in each battle group were commanded by captains. The pentomic reorganization was based on the concept that tactical operations on a dispersed or porous battlefield would be conducted by smaller, faster moving, harder hitting, high-quality units which would concentrate quickly to fight and disperse again quickly to avoid the atomic blast.

The Army was not wildly enthusiastic about the pentomic concept or tactical nuclear war, so after a brief trial period quietly shelved the pentomic division. Tactical nuclear warfare had failed to capture the Army's imagination. The advantages of alacrity and responsiveness were hard to demonstrate. More important, in the short run it failed to provide career progression or even jobs for infantry officers between the grades of captain and colonel. This flaw turned out to be lethal for purely institutional reasons.

The reorganized army division (ROAD) of the early 1960s was generally a return to the World War II format with a few significant adjustments—brigades instead of regiments, no artillery general and some functional changes in combat service support. There was no murmur at this turn of events but rather a huge sigh of relief upon returning to the comfortable and familiar doctrinal ground of the past. The armored divisions, largely untouched by the pentomic experiment, were brigaded and enjoyed some additional "carburetor"adjustments.

Large, formally organized, doctrinally driven institutions absorb conceptual changes slowly and often reluctantly. In fact, an Army is preoccupied, through its schools and career incentive programs, to imbed and strengthen a deep faith and commitment to existing doctrine. Any attempt to change that doctrine, suddenly produces deep-seated and broadly based resistance.

The extent of this resistance is proportional to the success of the preceding indoctrination and the accumulated personal experience of the members, as well as their professional stake in a system assiduously mastered over many years. Armies could not be battleworthy if this were not true.

So conceptual or doctrinal change is much like drastic surgery; it should only be undertaken for the most powerful reasons. It can only be done under the active authority of the collective leadership at the top.

Yet, it is often true that the conceptual leaders of an army are not also the highest authorities—in their times. J. F. C. Fuller, Charles DeGaulle, Heinz Guderian, Adna Chaffee, and, more recently, Hamilton Howze, are all examples. Those who occupy the seats of power and control the incentive systems must be convinced of the necessity for change in order to be willing to bring it about, even against the grain of the Army. The chiefs of the German general staff faced the same problem in the late 1930s as they imposed the concepts of Gen. Guderian on the ultraconservative and skeptical institution that was their army.

Hard evidence in support of a new concept is difficult to come by. In the case of Gen. Guderian's early tests and demonstrations, the tanks tended to break down. Today at Ft. Hood, much of the new equipment with which to test the new concept is not yet on hand. No set of tests, however carefully designed, will provide wholly one-sided data in support of a new concept. So the high command will not find test results that easily point the way. Nor can it expect to find broad support throughout the Army for the changes proposed. In the end, it must sift the evidence, discern the major features of the problem, and rely on its professional judgment.

Let's look more closely at the proposal and its background. Because of the cost of and preoccupation with the Vietnam war, the Army lost a generation of modernization. New model developments piled up and now the Army is confronted with the most extensive modernization program in its history. The next decade will see virtually every major weapon or piece of equipment replaced by a much more capable but more costly and complex counterpart. Some of the new weapons possess astounding capabilities when compared with their predecessors. In fact, almost all the new weapons and equipment may be classified as high technology.

The challenge is to achieve comparably high battlefield performance. The question is whether current organization and tactics are capable of coping with the new complexity and lethality and of exploiting fully the new weapons in order to win battles against a more numerous and technically modern opposing force.

In short, are we ready for the future?

For every 100 soldiers in the division forces of the Army (those forces which go off to war), there are, excluding individual weapons, 70 major items of equipment. The Army, like the Navy and the Air Force, has become capital-intensive and weapons-dependent. Winning battles depends upon the efficient employment and continuous operation of highly lethal and highly complicated equipment. If the 1,200 M60 tanks in Europe are deadlined or in the hands of poorly trained crews, the battles will be lost no matter how famous the division or brave the leaders.

Historically, the Army has been unit-oriented, whereas the Air Force, for example, has been weapon-oriented. The squadron and wing of F-15 aircraft are organized precisely to support, train and employ that 20-million-dollar fighter. The infantry company, on the other hand, has been regarded as a constant factor in the combat equation to which is added, from time to time, new-style rifles, grenade-launchers, mortars, antitank weapons, and even fighting vehicles.

Further on, we will consider the tactical side of this problem, but first we must be quite cold and thoroughly objective in assessing the current proficiency in our use of weapons and equipment. In doing so, we are not being critical of the individual officers, NCOs or soldiers involved; they do superbly well in the conditions we have created for them. Rather, we are concerned here with analyzing the conditions and environment in which company-level personnel are forced to operate.

Our companies are large, much more so than those of the Germans, Israelis or Soviets. They are functionally complex; in a mechanized infantry company, for example, they maneuver in the case of rifle platoons and attached tank platoons, provide antitank guided-missile fire and give direct fire support with their own mortars. They also perform the functions of administration, supply and maintenance.

Each infantry company has an arms room full of equipment. They are endemically understrength in soldiers and in properly experienced NCOs. Personnel turnover is rapid. Teams and crews stay together for very short terms. Maintaining complex equipment with partially trained mechanics is a staggering problem. A thousand distractions and diversions hamper operations and training.

The company-level command structure of professional officers and NCOs can cope with almost any set of problems if they arise one or two at a time. But, under the conditions we have created they cannot be expected to simultaneously solve a cascade of problems—and yet, simultaneity characterizes the battlefield.

Consider the time and effort required to prepare for annual or semiannual tank gunnery qualification exercises. Consider the state of tank gunnery during the off-season when time and attention are focused on other requirements, such as individual proficiency (SQT tests), unit proficiency (ARTEPS) or administration and logistics (AGIs and CMIs).

A real measure of a unit's effectiveness would be to administer all four qualification tests or inspections within the shortest possible time—say two weeks—for success on the battlefield requires all the individual and unit skills to be exerted simultaneously. It would not be surprising in this method of testing to find performance down by 50 percent or more, across the board.

The burning question is whether there are practical answers to cope with the convergence of complexity and simultaneity. One response is to say, "It's always been that way." But we have not always had XM1 tanks that will cost a million dollars each. We have never before had infantry fighting vehicles (IFV) costing a half-million dollars, and which each will have more combat power than a whole platoon and as much technical complexity as the tank. Nor have we had antitank weapons that fire a single missile round costing nearly $4,000.

An army that will have to fight out-numbered must attain performance advantages by exploiting the full potential of the new weapons.

Consider the problem and the challenge of the XM1. Tank training has never been easy. Under current training and management conditions, the average M60 crew does not achieve more than 60 percent of the potential of the tank gun and fire-control system, even during the semiannual tank gunnery seasons. Between the intensive training periods the level of proficiency is drastically lower. The XM1 adds a night-fighting and shoot-on-the-move capability which will require even more difficult technical and tactical training. Bringing an XM1 crew up to reasonable standards will be comparable in many respects to training air crews in sophisticated armed aircraft. Master gunners and master tacticians backed up by master mechanics will be required.

Correspondingly, there is little likelihood of exploiting fully the new IFV within the framework of the current company organization. This vehicle has the complexity of a tank and the combat power of an armored ATGM launcher. It has a high-velocity, dual-purpose automatic cannon, night sights and a rifle squad on board, with a machine gun and both Dragon and LAW dismountable antitank weapons.

The almost revolutionary heavy antitank guided missile TOW has been placed in the infantry as a "tag-along" weapon. Frequently, the ATGM TOW is improperly employed because it is tied too closely to the infantry company operation. The infantry, by definition, operates in close country, such as forests and towns, whereas the heavy ATGM needs open vistas and long ranges.

The Roland and Patriot air defense weapons, TACFIRE and artillery-locating radars and attack helicopters pose the same kinds of problems in other branches.

Skill, management and training technology must be concentrated on these central weapons without distractions or diversions. There are many ways that this can be done, but the most straight-forward, simplest and least disruptive is to create small single-weapon companies—tank companies of ten tanks and 50 men, mechanized infantry companies of 13 IFV and 100 men, ATGM companies of 12 ITV and 50 men, mortars withdrawn from companies and concentrated at battalion, administration withdrawn from companies and concentrated at battalion. The net effect increases the number of officers and sergeants per weapon system while reducing either the scope or complexity of their functions, or both.

In more detail, the proposed organization has three tank companies in each armor battalion with three platoons of three tanks each, plus a tank for the company commander—a total of ten, compared to the 17 tanks of the current company. The mechanized infantry company has three platoons of four IFVs each and one more in the company headquarters—13 in all. The rifle squads are reduced to nine men. There are no weapons platoons or mortars. The entire company totals about 100 men, compared to the present 180. The antitank guided-missile TOW on the improved TOW vehicle (modified M113) is in a separate company in both infantry and tank battalions. The mortars are in a separate platoon in the headquarters company.

Lifting the burden of administration from the company headquarters enables leadership and management skills to be concentrated on training and battlefield performance. Even with these changes, a company commander, his executive officer, a first sergeant, three platoon leaders and three platoon sergeants will be hard-pressed to extract the full value of the XM1, IFV or the ATGMs.

Tests have indicated that the smaller tank platoons are 14 to 40 percent more effective than the larger five-tank platoons in terms of tactical effectiveness. On the average, the three-tank platoon has its XM1s on the proper part of the battlefield doing the correct thing at the right time about 25 percent more often than the larger and more cumbersome platoon. This seemingly small adjustment can be extrapolated to the equivalent combat power of one whole tank battalion in a European-sized division.

What explains the increased effectiveness of the smaller platoon? There is no mystery; it becomes the equivalent of a flight leader and two wing-men who habitually act in accordance with the long-honored formula, "Follow me and do as I do." According to the Bible, Gideon directed his soldiers, "Look on me and do likewise."

The Israelis have demonstrated the high-performance of such a tactical system. The Soviet tank divisions are similarly organized and the German general staff favors the smaller, simpler formations.

Many other measures besides doctrine and organization need to be taken. Above all, there is performance-oriented technical and tactical training. The personnel and logistics systems must be oriented on the principal weapon systems. We cannot have the best man on a $200 typewriter while a less qualified soldier operates a million-dollar tank.

The battalion has been the basic tactical building block from Napoleon and Wellington through World War II. The company was a tightly controlled element of the battalion which operated most of the time within the range of vision and direct influence of the battalion commander, who also coordinated artillery and tanks with infantry. Yet after World War II, the experience of 34 continuous years of duty in central Europe has changed this outlook and the character of the U.S. Army.

The great majority of our line officers and NCOs have served one or more long tours of duty in Germany with the V or VII Corps. The mission during all those years was defense. The frontages have been disproportionately wide because of the relatively few troops available, and commanders have had to spread their forces thinly. In the 1950s it was not uncommon to find platoons operating independently—that is, out of visual contact and thus out of mutual support with adjacent platoons or parent companies. The only possible tactic was a rapid retrograde movement along with hope for reinforcements along the line of the Rhine.

The development and introduction of 12 additional German divisions in the line made it possible to reduce frontages substantially, even though they still remain relatively wide. By the 1960s and 1970s, the focus of independent action had moved from platoon to company. Today, the standard deployment patterns and tactics center on the actions of company teams consisting of tanks, mechanized infantry, antitank guided missiles, and mortars supported by artillery, helicopters and tactical aircraft.

We did not arrive at this state of affairs by design, but rather by force of circumstance. The vast distances and poor visibility in Vietnam reinforced the Army's focus on company operations. Although the current system is not all bad and although our companies are strong and our peacetime company commanders, on the average, very capable, the company is hard-pressed to achieve high performance in terms of weapons proficiency.

To this has been added the chief responsibility for battlefield integration of the combined arms and the coordination of fire support. We seem to be asking too much from our companies. The application of our combat power depends too much upon one man—the company commander—who is already overburdened far forward on a lethal battlefield. This is what the Israelis are trying to tell us and this is also what the Germans seem to believe.

At this point, it may well be asked how we are going to get around the hard fact of the wide frontages. There are two mutually interdependent answers: first, substantial reinforcement from the United States is required in any event to meet a full Warsaw Pact onslaught. Second, a larger number of smaller battalions, coupled with strategic reinforcement, will permit battalion sectors to be narrowed to a point where classic battalion-level operations are feasible. Certainly, this would be true in the areas of main effort where the outcome of the battle will be decided.

It is a good rule that any tactical element which operates independently—that is, out of mutual support and coordination range of its parent unit—must contain the elements of the combined arms team. (Mutual support and coordination range simply mean within the range of direct-fire weapons, 2,000 to 3,000 meters, and generally within the controlling commander's line of sight.) Thus, a decision to shift the focus from company back to battalion stipulates that the battalion must operate within a tactical compartment that meets the criteria of mutual support and substantial line of sight.

Testing of the new concept must be consistent with this principle.

There are additional disadvantages associated with the company focus. The greatest is that it works against the concentration of combat power. This assertion appears to be inconsistent with the idea of smaller units, but, in fact, it is not. Forming combined arms teams at the company level results in the exchange of platoons between companies.

In the case of a tank company, it takes under its operational command one platoon of mechanized infantry. This platoon is the only infantry available for the independent missions assigned to the company. This arrangement might be adequate for a delaying action, but it is certainly marginal for the attack or the active defense.

A mechanized rifle platoon would have a wartime complement of 25 to 35 men and probably average 30. With four infantry fighting vehicles, each of which requires a driver and gunner to remain mounted, the number of infantrymen available to fight on foot will be little more than 20. These small platoons operating with company teams must perform all the mechanized infantry functions for *all* independent missions. This includes clearing small hamlets, wood lines and a dug-in enemy; providing protection for tanks and antitank guided missiles at night and in bad weather; and holding critical terrain.

In general, a platoon is inadequate for these tasks when the enemy is operating primarily at battalion and regimental levels. Two or three casualties will often stop a platoon and will almost certainly stop it if the casualties include the platoon leader.

In the small-battalion concept, a full rifle company would be assigned to the tank battalion. Under the direction of the battalion commander, it would be used in its entirety for one infantry mission at a time. This would concentrate 13 infantry fighting vehicles for fire support of a dismounted contingent numbering at least 60 men and up to four officers led by a captain.

This example illustrates one of the conceptual difficulties associated with the proposed new organization. The battalion task force commander, with his supporting staff and larger, more robust, and powerful maneuver elements, operates almost precisely in the manner of a company team commander under the current concept.

But he has greatly increased effect, much more than the numerical multiple involved. The techniques of control are more personal and direct. The battalion commander cannot operate by deliberate assignment of boundaries and will have little time for elaborate estimates or troop-leading procedures.

It is here that the proposal runs into a prickly hedge. There is at least one generation of officers which has had fixed in its minds the image of the company commander coordinating the combined arms team and acting as the principal agent for the application of combat power against the enemy. Anything less is, understandably, regarded by many (probably most) as insulting, a step backward, a vote of no-confidence. Many battalion commanders tend to see no justification in reducing their commands by 40 percent when they see nothing ahead but combat against larger opposing forces. Recent articles in *Armor* magazine attest to these reactions.

But many reasons argue for moving the focus of combined arms operation up to battalion. On the European battlefield, against very large Warsaw Pact armored forces, the basic tactical problem arises from the relationship among time, the number of defending weapons and the number of enemy targets. The average visibility interval in central Germany is less than one mile. Normally, then, the enemy attacking force becomes visible to the defending forces and weapons as it comes around the corner or over the next wooded hill to the front at a range of 1,500 meters or less. Soviet tactics in this situation are very clear: suppress the defending weapons with heavy artillery fires and move fast.

If the Soviet armored force would move at 20 kilometers an hour, it could close on the defender in less than five minutes; at ten kilometers an hour, less than ten minutes. Given natural obstacles such as streams and soft ground or snow in winter, at ten-kilometers-an-hour rate of advance is more probable. In either event, the defender has precious few minutes to engage and destroy the attacking force.

Tank Battalion

	Current	Under Study
Personnel		
Officers	34	35
Warrant officers	2	3
Enlisted	516	436
Weapons		
M60	54	—
4.2-inch	4	—
Redeye	5	—
81-mm	—	6
XM1	—	36
TOW	—	12
Vehicles		
M60	54	—
XM1	—	36
M577	6	7
M113	18	19
M578	2	—
M88	5	5
M125	—	6
M106	4	—
ITV	—	12
AVLB	2	2
Wheeled	78	53

Current Organization (54 tanks): large 17-tank company—five-tank platoon; own maintenance in company; no TOW.

Battalion Under Study (36 tanks): common base with mechanized battalion; smaller company—11 tanks (smaller platoon—three tanks); one extra tank crew per company; maintenance, mess, administration, supply at battalion—combat service support company; 81-mm mortars—six in headquarters company; separate TOW company—three platoons of four TOW each; no scout platoon.

Consider the basic tasks that must be performed in those action-packed and terrifying minutes. Consider, too, that they must all be performed whether the tactical echelon is a company or a battalion. To the extent that time does not permit them all to be accomplished, is combat power lost.

Assume that the defending force—company or battalion—consists of tanks, mechanized infantry, antitank guided missiles (ITV, at least) and mortars, and is supported by artillery, attack helicopters and close air support. In every task listed below, a passage of verbal instructions is required, whether by radio transmission or by conversation:

- Alert subordinates to appearance of enemy.
- Report to higher headquarters appearance, nature and apparent strength of enemy.
- Initiate defensive direct fires.
- Call for scatterable mines (at least two transmissions).
- Call for armor-penetrating area submunitions (DPICM) or laser-guided antiarmor projectiles (CLGP) or both. Remember that CLGP requires near-continuous communication via artillery channels. Adjust location or priority several times.
- Redistribute fire (at least two transmissions).
- Change radio frequency under jamming (time delay).
- Issue orders to reinforce threatened sector (at least two transmissions).
- Medical evacuation (several transmissions).
- Adjust artillery to conform with battle (repeated transmissions).
- Adjust mortars to conform with battle (repeated transmissions).
- Coordinate commitment of attack helicopters (several transmissions).
- Request and coordinate close air support (several transmissions).
- Respond to requests for situation report.
- Issue orders to displace to alternate battle positions or counterattack (several transmissions).
- Appoint and dispatch commanders to replace casualties.
- Move to observe critical sector.
- Redistribute critical ammunition or fighting vehicles.

Even if each of these tasks could be performed with perfectly working radios in a non-stress environment—as, for example, in a war game or battle simulation—they could not possibly be accomplished by a company commander in five, or even ten minutes. Not only would artillery fire-request and fire-direction transmissions be continuous over any period of time, but heavy Soviet artillery suppression, the direct fire of 50 to 100 tanks and self-propelled artillery, together with probable barrage jamming, would severely reduce efficiency.

This is not an exaggerated picture. Murphy's Law has not been introduced. We have not wounded or killed the company commander or the artillery forward observer. At least 20 radio transmissions on the single command net would be required to develop fully all the combat power available, even with excellent pre-planning. In short, it would be impossible under battlefield conditions to handle such a load at company level. A large fraction of combat power would consequently be lost at precisely the critical time.

This is a glaring fault in design in the present system which selects the company as our principal agent for coordinating the combined arms and for applying combat support fire power.

In comparison, the battalion has 3 1/2 times the number of artillery and mortar observers and radios. It has four times as many command radios and channels. It has a staff to handle reports to higher headquarters and to request and coordinate close air support and helicopters. It can

distribute specialized artillery missions over a greater number of observers. It has resources to replace key casualties.

In short, it is more robust and resilient. While companies are prone to catastrophic failure, battalions degrade more gradually in heavy combat. Therefore, the battalion can be expected to exploit a much higher percentage of available combat power for each kilometer of front, each 100 men or each 100 tanks.

If the Army plans to base its reorganization decision on test results, then the scope of the test should include a fair comparison, under realistically simulated battlefield conditions (including casualty assessment against key people), of the capacity of the old and new organizations to generate and sustain combat power during critical operations where time is a major factor.

While the U.S. Army is considering a shift of focus from company to battalion, the German Army seeks to go one step further. Concerned about the anticipated size and intensity of a Soviet attack, the Germans, under conditions of high criticality and high concentration of forces, favor the employment of pure battalions under the close coordination and control of a brigade commander. In the zone of the main effort—at the *Schwerpunkt*, in German—the pure battalion is thought to be more appropriate to the magnitude of the combat tasks. The brigade commander conducts the combined arms battle and actually moves his battalions within his scheme of maneuver. Certainly, the German Army will be forced to operate with cross-reinforced battalions for much of the time but never with cross-reinforced companies.

It is much more difficult to concentrate combat power efficiently when the combined arms are integrated at the company level. In order to assemble a large number of tanks for attack or counterattack, two things would occur: it would take time to divest the formations of their mechanized infantry, or the infantry would be dragged along even though not required or desired.

The realities of modern weapons, the relationship between time and space, the importance of speed in reaction, the ratio of forces expected to be engaged and the level of combat anticipated in Europe—all these call insistently for shifting the combined arms focus from company to battalion level.

Concentrating talent and management on high-technology weapons to achieve equally high battlefield performance, reducing the size of units to increase efficiency of employment, shifting the focus of combined arms coordination to smaller but more numerous battalions—all this requires an increased number of leaders on the battlefield.

This, too, has provoked skepticism about the practicality of the reorganization under study. Historically, Congress has been sensitive to the officer and NCO ratios and has kept them down. In recent years, the ratios have been slightly reduced, so it is no small matter to propose the enrichment of the leadership mix in the combat echelons of the Army.

It may be that the problem could be solved by reallocation within current allowances. After all, we are speaking of about six lieutenant colonels for each division. With 16 active divisions, this adds up to only 96 lieutenant colonels out of some 10,000, and to about 500 captains out of 25,000. If more officers and NCOs are required in the Army as a whole, there are two additional and powerful incentives for going after the necessary authorizations.

Infantry Battalion (Mech)

	Current	Under Study
Personnel		
Officers	37	31
Warrant Officers	2	3
Enlisted	809	547
Weapons		
TOW	18	44
81-mm	9	6
4.2-inch	4	—
Dragon	27	27
Vehicles		
M577	6	1
M578	6	2
M88	—	3
M113	63	17
M125	9	6
M106	4	—
M220 (ITV)	18	12
MICV	—	32
Wheeled	72	40

Current Organization: 171-man company; rifle platoons, TOWs, mortars, maintenance integrated in company; combat support company—TOWs, mortars, scouts; 11-man squad.

Battalion Under Study: common base with tank battalion; pure rifle companies; nine-man squad; AT (TOW) company—12 TOW; 81-mm mortars—six in headquarters company; mess, maintenance, supply, administration at battalion; combat service support company; no scout platoon.

Although the combat power of armies is rising exponentially, the number of soldiers on the battle line has been declining steadily. At Waterloo, the Duke of Wellington disposed of nearly 20,000 men for each mile of front. When Gen. Alexander von Kluck made his famous right hook toward Paris through Belgium and northern France in World War I, he had 10,000 men for each mile of attack zone. In the same war, the British Fifth Army, which was overrun by the last great German offensive in 1918, deployed 15 divisions on a front of 40 miles or a density of about

5,000 men a mile. In World War II, the density was more nearly 2,000 men per mile. In Germany today, where the U.S. 1st Armored Division of 16,000 men is expected to fight on a front of nearly 50 miles, there are between 200 and 300 men per mile. Even more to the point, of the 16,000 men only 7,000 are in tank and infantry elements. This brings the fighting density down to between 100 and 150 front-line soldiers per mile.

This arithmetic illustrates the fact that fewer and fewer soldiers dispose of more and more combat power and are increasingly responsible for critical terrain. Is it then illogical to concentrate more quality on the cutting edge?

Between wars, we tend to forget how terrifying and intimidating the actual battle up front is between soldiers who apply direct-fire weapons against one another. Contrary to the romantic myth, few men are very good at it and even fewer like it.

After World War II, military historian S. L. A. Marshall published *Men Against Fire*, in which he showed that even in the most elite airborne units half the paratroopers never fired their weapons at the enemy during the hottest battles when their own lives were in grave jeopardy.

In some units, the level of active participation in battle never exceeded ten percent. A respected Israeli airborne commander, asked how many men continued to fight when the going was at its toughest, replied, "Each officer and the man on his right and on his left."

There are a few natural fighters in every unit, but those who have long experience in front-line battle know that the sergeants and junior officers carry the load when the battle goes critical. There can be no doubt that front-line fighting effectiveness is directly proportional to the number of leaders present. Not every sergeant or officer is a battlefield leader, but the process of selection and training guarantees more leadership, both natural and induced, in the ranks of the NCOs and officers than among average soldiers of the line. As the lethality of weapons goes up and the number of men goes down, the leader ratio must rise.

There is another decisive advantage in raising the front-line leadership quotient and it has to do with decentralizing tactical authority on a fast-moving battlefield. During World War II, the German Army achieved astounding results against the much larger and stronger Soviet Army. There were many reasons for this, but one of the most important was the echelonment of tactical control. The Russian Army was then, and to some extent is now, a highly centralized mechanism. The German Army was and remains essentially decentralized with its tactical initiative pushed to the lowest echelon.

The tactical philosophy of the U.S. Army is patterned after that of the Germans, and the Israeli Army is the near-ultimate application of this concept.

While the centralized force is experiencing and observing the results of combat action, sending its sensings to a remote control center, digesting their meanings and concocting reactions, the decentralized force has already embarked on a whole new series of actions finely tuned to the realities of the real-time situation. The smaller, faster, more competent force is like the agile, maneuverable fighter aircraft, which can turn inside a heavier opponent and win. The centralized system reacts to old sensings, which more often than not, quickly lose operational value.

Totally mechanized forces, to a large extent, fight defensive and offensive battles with the same battlefield techniques of cover, concealment, suppression and teamwork. To exploit fully the mobility and combat power of the force, decision-making should be decentralized to the man on the ground who works within the mission imperative and conceptual framework of his next higher commander. The German Army regards this principle, coupled with meticulous training, as the foundation of its historically demonstrated high performance.

The lethality of modern weapons requires a high degree of tactical skill and adaptation to the terrain and situation. Decisions and plans made in remote control centers can well lead to disaster on the line of contact. Creating a larger number of smaller but higher performance battalions is simply a method of pushing intermediate commanders with tactical authority closer to the battle scene. They have additional dangers, but they also have additional opportunities to exploit a slower and more deliberate enemy.

The organization being tested at Ft. Hood would add six lieutenant colonel battalion commanders and six sergeants major, 30 captain company commanders and 30 first sergeants, and 90 lieutenant platoon leaders and 90 platoon sergeants for a total of 250 frontline leaders per fighting division. More leaders per weapon system, more leaders per soldier and more leaders per kilometer give more performance per battle.

There are other important aspects of the proposed reorganization. The most important would be to increase the number of artillery tubes and batteries to enable the delivery capability to keep pace with demands during critical operational time segments. The artillery recently went into a slight decline when the tank and the antitank guided missile became the primary weapons on the NATO battlefield where armor killing is the name of the game. Even today, some professionals are ready to trade off artillery for more antitank capability.

But like any healthy organism, the artillery has adapted to the milieu. It developed three new types of munitions, each antiarmor in design: the laser-guided antiarmor projectile (CLGP), scatterable mines (FASCAM) and armor-penetrating area submunitions (DPICM). These, plus smoke, illumination and good old high explosive, have put the artillery back in business on the armored battlefield, so much so that it will be saturated with requests for one or another of its capabilities as soon as the battle starts.

Additional reorganization matters: the air defense artillery organization would be tightened; a chemical company added; the division engineers pushed forward into the tactical battle zone; the electronic warfare structure improved; and some progress would be made toward system-oriented logistics.

The combat doctrine of the world's leading armies is based squarely on the concept of armored warfare that was developed during World War II, mostly by the Germans. Now, nearly 40 years later, that doctrine has matured and ripened, has been demonstrated in the Middle East and has been infused with new vitality through high technology.

If the next major war occurs in the near future, whether in Europe or elsewhere, involving modern mechanized armies, this refined and reinforced doctrine will undoubtedly prevail, at least at the outset. Then new tactical applications of new technology will appear under the pressure of actual combat. Almost certainly, there will be expanded use of airmobile systems of all kinds.

Underlying this tactical evolution will be the steady advance of military technology with its increased lethality, greater complexity, and higher potential.

The quality of the human material will not improve correspondingly. The army which recognizes the scope and nature of this problem and adapts its organization, tactics and training to the new realities will prevail upon the battlefield. The armies which do not recognize the problem, or do not adapt, will go down to defeat on a battlefield littered with the evidence of missed opportunities.

2

Technology and Tactics in Defense of Europe

By Gen. William E. DePuy
U.S. Army, Retired

Not only NATO's soldiers, but its politicians, scientists and public policymakers must understand that the right tactics harmonized with modern weapons—that is, the evident ability to fight—form the true basis of deterrence.

Weapons are the product of new technology. Tactics are the application of new weapons to military problems. Good tactical concepts, in turn, feed back on the refinement of new weapons. In the hands of proficient crews and under the direction of skilled commanders new weapons and new tactics can be combined to win battles—even lopsided battles against larger forces such as those confronting NATO in Central Europe.

In June, 1940, the German attackers and the Anglo-French defenders were possessed of roughly equal strength and technology. Any small advantages were in favor of the Anglo-French. But equal strength and technology were overwhelmed in a dramatic display of superior tactics by the German Army.

Now a whole new generation of military weapons is passing into the hands of all the modern armies. The prime military problem of the West remains that of defending NATO Europe against increasingly strong and rapidly modernizing forces of the Warsaw Treaty Organization (WTO). Other military problems will surely arise elsewhere, but NATO is by far the most demanding and by U.S. government policies and priorities provides the mission basis for the development of American forces.

Therefore, by definition and precedent, it is necessary to review our tactics—the application of new weapons—in the context of NATO. The military problems may be summarized as follows:

- The requirement for forward defense along the eastern boundary of West Germany.
- The existence of modern enemy forces which at the outset of hostilities would outnumber the NATO defenders by more than 2 to 1.
- The paucity of maneuver room in which to fight a defensive battle because of the narrow configuration of West Germany.
- The unequal reinforcement capability of the two sides, which means that force ratios would worsen as time goes on.

In the framework of these problems the right combination of technology and tactics must be found and expressed with simplicity and clarity so that thousands of minds in the several NATO countries can coalesce around the essential elements. Not just soldiers but also scientists,

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engineers, defense managers and political leaders should have a common concept as the basis for their actions, including the design of the next set of weapons.

I will also consider here a conceptual framework built around the requirements for concentration, elasticity, coherence and counter-concentration.

- *Concentration*—mass at the critical points. Napoleon, in 1794, said:

> The same rules obtain in the conduct of campaigns as in the siege of fortresses; the fire must be concentrated upon one point. The breach once made, the equilibrium is disturbed, all the rest becomes useless.

In terms of relative strength, or the correlation of forces, as the Soviets say, NATO is at a critical disadvantage. In a short-warning attack, that is, with forces already on the ground, the WTO would enjoy an advantage of somewhat better than 2 to 1.

It is almost exactly 2 to 1 in division equivalents; 2.5 to 1 in tanks; and somewhat less than that in artillery, antitank guided missiles (ATGM), tactical fighters and infantry. And this 2 to 1 superiority is across the whole front before the attacker concentrates, and before reinforcements begin to arrive from the western Soviet Union.

Granting that strength ratios do not necessarily equate to combat power (weapons quality, tactics, performance and courage all count heavily), they are, nonetheless, a sensible place to start.

Conventional military wisdom has long had it that a defender can cope with a 3 to 1 adverse force ratio. Therefore, to be safe, the attacker would like to have something like 6 to 1 in his favor at the point of main effort—the *Schwerpunkt*, in German parlance. The Russians agree. S. M. Shtemenko wrote in *The Last Six Months* (Doubleday):

> We had no great superiority over the enemy, especially on the 3rd Ukranian Front. The ratios were as follows: in troops, 1.2 to 1; in guns, 1.3 to 1; in tanks and self-propelled guns, 1.4 to 1; in machine guns, 1 to 1; in mortars, 1.9 to 1; and in aircraft, 3 to 1. Obviously, we would have to compensate for this inadequate superiority by massing our forces on the sector of the main blow. It was decided to solve the problem by stripping all secondary sectors of the front. Here is the striking picture of the front then offered . . . troops, 6 to 1; guns, 5.5 to 1; tanks, 5.4 to 1; machine guns, 4.3 to 1; mortars, 6.7 to 1; aircraft, 3 to 1. This edge of superiority was sufficient for breaking through the enemy's defenses and exploiting the success. All the rest depended on the skill of the commanders and the skill and self-sacrifice of the troops.

Conventional wisdom, based on experience, is supported by war-gaming and analysis. Over a long period the war games conducted at Ft. Leavenworth, Kan., the Combined Arms Center of the U.S. Army, affirm that the defender usually begins to lose when the attacker's advantages rise above 3 to 1.

At the Army Materiel Systems Analysis Agency at Aberdeen Proving Ground, Md., the threshold is 2.6 to 1. So, 3 to 1 is a good round figure.

There is very little room for tactical error on the part of the NATO commanders. It does not take much head start to turn an overall advantage of 2 to 1 into local advantages of over 3 to 1. The attacking commanders will use every trick in the book to bring about faster and larger concentrations—to beat the defender to the punch.

Although Russian commanders in World War II developed a strong preference for massive concentrations on relatively narrow fronts, there are those who feel they may not do so in the future.

Weighing against the probability of a few very large concentrations are: the nuclear targets thus formed; the time and massive movements involved, which can hardly be hidden from modern sensors; the opportunities which would be presented by a surprise attack in which the defenders

would not yet be in position, and that a broad front attack would permit the initial commitment of more combat power than would be the case with the deep echelonment of the classic breakthrough formations in which whole divisions are held back in follow-on echelons.

Arguing in favor of the big breakthrough technique is not only the battle experience of the senior Soviet officers but also the fact that larger exploitation forces would have more stamina, more velocity and more decisive effect deep in the NATO rear.

But we cannot know beforehand what the Soviet commanders will do. We only know that whether they try a few big attacks or many smaller thrusts, the defending commanders must acquire information on enemy strength and movement, communicate that information to command and control centers, sort it out, make decisions, and set defensive forces and actions in motion—fast. The U.S. Army now calls this function "force generation."

But whatever it may be called, it would have been futile, even in the recent past, to think that any of this could happen in time. Intelligence was mostly based on information which came up from the bottom—from units already locked in combat with the concentrated enemy force. The Battle of the Bulge is a classic example. But more and more, combat information and intelligence are coming down from the top. The higher echelons of command own and operate or have access to the long-range sensors.

Even so, the difficult fact is that almost every echelon in the affected sector needs this information immediately—from the supreme commander to the colonel commanding a brigade in the path of the onslaught. There is not time for each echelon to consider the evidence, arrive at conclusions and pass them on—*seriatim*.

This latter practice would bring the information to commanders up front much too late to help. What is required is a combination of streamlined operational and intelligence procedures supported by multiple access communications and distribution systems. Critical combat information must be moved in near-real time—intelligence based on correlation and fusion of that information as soon thereafter as possible. There is no reason why such a system cannot be developed, procured, deployed and put into operation so that our brigades and battalions, properly concentrated and supported, can "be there waiting."

Coupled with tactical warning is the high proportion of combat power that will be available to the division and corps commanders in the form of long-range artillery (including missiles and rockets), attack helicopters and tactical fighters. This mobile firepower can be concentrated in minutes while the slower moving, direct-fire ground weapons are assembling at the *Schwerpunkt*.

As doctrine of the modern German Army HDv 100/100 states:

> It is the task of every major commander to adapt at all times the point of main effort of the defense, particularly of fire and air support, to the changing situation. For this purpose he will move forces from less threatened areas and employ them where the course of the battle requires.

However, at present only the artillery is a day-night, all-weather system, and even the artillery has limitations in conditions of restricted visibility. The laser-guided projectiles cannot operate in fog, heavy rain or smoke. Forward observers often cannot see or adjust fire in such conditions.

Most of the precision-guided munitions are similarly affected. Furthermore, the delivering aircraft and helicopters are faced with severe limitations at night and in bad weather. Helicopters will break this barrier before high-performance fighters simply because they can adjust their speed and altitude to visibility conditions. Fighters can be handled in these conditions, but the technical solutions are so complex and elaborate that there are very stringent limitations on the rate at which high-performance aircraft can be employed.

Additionally, WTO air defenses are designed to keep high-performance tactical aircraft from concentrating combat power on the forward battlefield. The battle of technology between enemy air defenses and the tactical air forces has become a modern epic. It is impossible to view with certainty the status of this contest at any one time, let alone project confidently into the future. It is certain, however, that tactical air forces will not be fully effective over the battlefront unless enemy air defenses are physically, optically or electronically suppressed.

Suppression of enemy air defenses will require the combined efforts of the Air Force and the Army. Army artillery, rockets, missiles, electronic warfare (EW) and attack helicopters should all be integrated into the suppression operation. The fact is that the Army and the Air Force have not yet learned how to synchronize their combined capabilities in this complicated operational arena. But the Army is pressing its suppression assistance upon a slightly skeptical Air Force simply because the Army desperately needs effective air support.

It would be misleading to leave the subject of concentration without touching upon surprise, deception and performance. No matter what the force ratios may be, a sleeping, maldeployed or ill-trained force disposes of very little real combat power. What Gen. George Washington did at Trenton, so, too, did the Japanese at Pearl Harbor, and so surely will imaginative and skillful commanders in the future.

The success of the Normandy landings owed as much to deception operations, which pinned down half of the German reserves, as to the rate of reinforcement over the beach. But of all the factors which tend to modify the value of raw force ratios, human performance dominates the scene.

The gap between potential and actual battlefield performance has always been large and is growing. The combat power of a brigade or division could be at least doubled by:

- Matching the high technology weapons with high-performance crews (more human quality).
- Improving tactical performance by organizing smaller units—that is, grouping the new weapons under a richer mix of leadership.
- Exploiting modern training technology.
- In short, creating technically and tactically elite fighting units around the new weapons.

Big battalions comprised of marginal performers are a formula for failure on a modern battlefield.

Finally, with respect to concentration, it is clear that the division or corps commander who fails to cover his opponent's moves with actual combat power ratios somewhere near the 1 to 3 threshold must find other answers to his tactical problems, at least until he can rectify his deployments, or until someone comes to his assistance. This brings us to elasticity.

- *Elasticity*—the ability to absorb shock; not frangible, not brittle: Corelli Barnett in *The Swordbearers* (Midland) wrote:

> Petain signed an instruction on the defensive action of large forces in battle. This instruction embodied all his own ideas and experience and also the lessons learned from the enemy; and it was issued at a time when it had become certain that the campaign of 1918 would open with a German general offensive in the west. Subordinate commanders did not universally welcome its emphasis on yielding ground forward, on elasticity. For the very soldiers who believed with a moral fervor in attack (like Foch) also believed with a similar fervor in not yielding a yard of ground. Once again they confused emotion, gallantry, pride in themselves and their country with technique.

At those places where the enemy achieves local superiority of a magnitude which exceeds the capability of the defense to contain, the defenders have the choice of expending themselves in

place or, if they are not on absolutely critical terrain, the option of trading a little space for time and casualties. Before we worry too much about the agonizing nature of this choice, it would be well to remind ourselves why it is that a defender can tolerate adverse force ratios of as much as 3 to 1.

There are two sets of forces at work. One is the effect of relative strength on battle outcome as expressed in the so-called Lanchestrian equations. Although somewhat controversial, as they were originally based on naval engagements, these equations say that the advantages flow to the larger force on a better than one-for-one basis. That is, one unit of strength added to the already larger force has an effect equivalent to more than one.

Pushing in the other direction are all the advantages which accrue naturally to the defender. These advantages, which account for the 1 to 3 tolerance of the defender, fall in the following categories: concealment and target acquisition, cover and exposure, stationary versus moving gunnery, and terrain and obstacles.

- *Concealment and target acquisition.* As the songbird knows when the hawk is near, the slightest movement will bring certain death. So, too, on the battlefield the stationary defender sees the moving attacker first, at longer ranges and with less error. Tests and analysis show that the defender has a range of advantage from 500 to 700 meters in all of these aspects, and also that the attacker makes three times as many false identifications as the defender.

This is not surprising because the stationary defender has also taken pains to conceal himself. If the attacker is in a buttoned-up tank (standard Soviet practice), he will be bumping across rough ground while trying to see through narrow vision blocks. The target-acquisition advantage goes decisively to the stationary and concealed defender.

- *Cover and exposure.* Defending armored vehicles can be dug into the ground by bulldozers gouging out ramp-like positions, or they can find cover behind natural crests or hillocks which provide protection for all but the heavily armored turret. The attacker on the other hand must leave cover in order to advance upon the defended position. Battle positions are selected by the defender in order to magnify this problem for the attacker.

The simple table below illustrates the magnitude of this advantage in terms of relative target size.

Exposure of Tanks in Attack and Defense (using M60s)

	Defender hull-down	Attacker in full view
Height of target in meters	**1.3**	**3**
Area of target in sq. meters	**3.5**	**10.4**

It does not take much imagination to translate this better than 3 to 1 difference in exposure into corresponding loss rates on the battlefield. In the case of infantry tests with direct-fire weapons, the dug-in defender has a 6 or 8 to 1 advantage over the exposed attacker. Defending positions specially constructed to provide frontal cover against direct-fire weapons add another 50 percent in effectiveness.

- *Stationary vs. moving gunnery.* Most of the main battle tanks now in the hands of troops on both sides of the Iron Curtain have single-shot hit probabilities (Ph) of more than 60 percent at a range of a mile if both the firing tank and the target tank are stationary. Even

if both sides have installed gun-stabilization systems on their tanks to provide a shoot-on-the-move capability, the Ph goes down sharply.

It is for this reason that, until recently, it has been the practice in most armies to fire from a short halt in the attack. These halts increase the accuracy of the attacker's fire but also increase his exposure and the probability of his being hit by the stationary and concealed defender. The newest tanks, especially the U.S. XM1, have stabilization systems so advanced that their Ph on the move is about equal to the Korean-vintage tanks while stationary. Even so, the stationary tanks will retain an advantage into the foreseeable future of at least 2 to 1.

Antitank guided missiles have interesting characteristics which drive their tactical employment. On the one hand, the heavy ATGM, with second generation guidance, have hit probabilities from 70 to 90 percent for a single shot out to 3,500 meters. In the range band from 2,500 to 3,500 meters, the ATGM outperforms the tank by at least 3 to 1. However, most of the heavy ATGM in service today are either lightly armored or not armored at all, and are susceptible to suppression or destruction by artillery fire and air attack.

They also have relatively slow rates of fire and cannot see or operate through heavy fog or smoke. They are even degraded by the normal dust and smoke characteristic of any battlefield. The ATGM must be carefully sited to take advantage of its long-range accuracy and to protect it against its vulnerabilities. As enemy tanks approach an ATGM it progressively loses its advantage. Under 1,500 meters, the faster firing, more heavily armored tank has the edge. Thus it is that the defender's advantages with the ATGM can be maintained only by preserving long stand-off ranges through tactical maneuver.

- *Terrain and obstacles.* In Germany the typical battle position is on a wooded hill or in the outskirts of a hamlet or town. Usually, the attacker must cross an open valley or fields fully exposed. The defender has the advantage in terms of target acquisition, exposure and gunnery which have been outlined.

Facing this situation, the attacker tries to minimize his problems by finding covered and concealed routes which will lead him as close as possible to the defended position. When he is forced into the open he suppresses the defender with artillery and direct-fire weapons and blinds him with smoke or attacks during periods of reduced visibility such as night, fog or heavy rain.

He also seeks to minimize his exposure by rapid movement, giving the defending weapons as little time as possible to engage. Lastly, he tries to throw a large force at the defender in hopes of saturating the defending gunners.

Correspondingly, the defender seeks to slow down or stop the attacker precisely when he is at the optimum engagement ranges for the defending weapons. The classic method for slowing the attacker has been the use of minefields laid athwart the enemy's expected line of advance. Test and analysis indicate that properly employed mines double the effectiveness of the defender—more exposure for the attackers, more time to shoot for the defenders make for many more targets hit.

The advent of artillery scatterable mines which can be thrown in the path of an advancing enemy even after he has started his movement puts an even more effective device at the disposal of the defender.

A combination of all the defender's advantages adds up to an impressive increase in combat power for each defending weapon or unit engaged. It is difficult to compute a single number which fairly represents these cumulative advantages because that figure would change constantly in response to force changes (casualties and concentration); range changes (as the attacker approaches); and terrain (intervisibility distances, cover and concealment).

Nonetheless, for the purpose of the Army's new battle book, such a number has been provided to help tactical commanders better understand the dynamics of the battlefield and to assess their plans and dispositions. In that battle book the defending M60A1 tank is given a kill rate per minute of .3, whereas attacking T62 Soviet tanks are given a rate of .02. This is an advantage to the individual defending tank of 15 to 1.

These advantages only apply to weapons on line; in line-of-sight with enemy forces and served by courageous, highly trained crews. Often the generals concentrate the brigades and battalions on the critical terrain. The colonels and captains must push their weapons up onto the line. The classic tactic of holding one-third of the force in reserve at *each* echelon (two up and one back) is a formula for certain defeat. It guarantees that a force already outnumbered voluntarily holds back more than 50 percent of its direct-fire weapons from the initial battle. Thereafter, the reserves are committed in futile pennypackets.

Obviously, the advantages of the defender are enormous, but they are not invincible. It is the doctrine of all experienced armies (but not necessarily the practice of inexperienced units within those armies) to avoid, whenever possible, battle on ground chosen by the enemy. Attacking into prepared defenses is always expensive, often fatal and usually unimaginative.

Unfortunately, there are times when it cannot be avoided: when envelopment, infiltration or surprise will not work. Even then the advantages to the defender diminish as the attacking force closes the range. The long-range defending weapons are no longer enjoying unreturned shots—target acquisition begins to equalize—hit probabilities go up for both sides and reach parity in the final melee. The larger side with more eyes and guns begins to prevail.

Although it will thus be necessary on many occasions to stand and fight, it must be understood that the defender's advantages decay over range and usually over time.

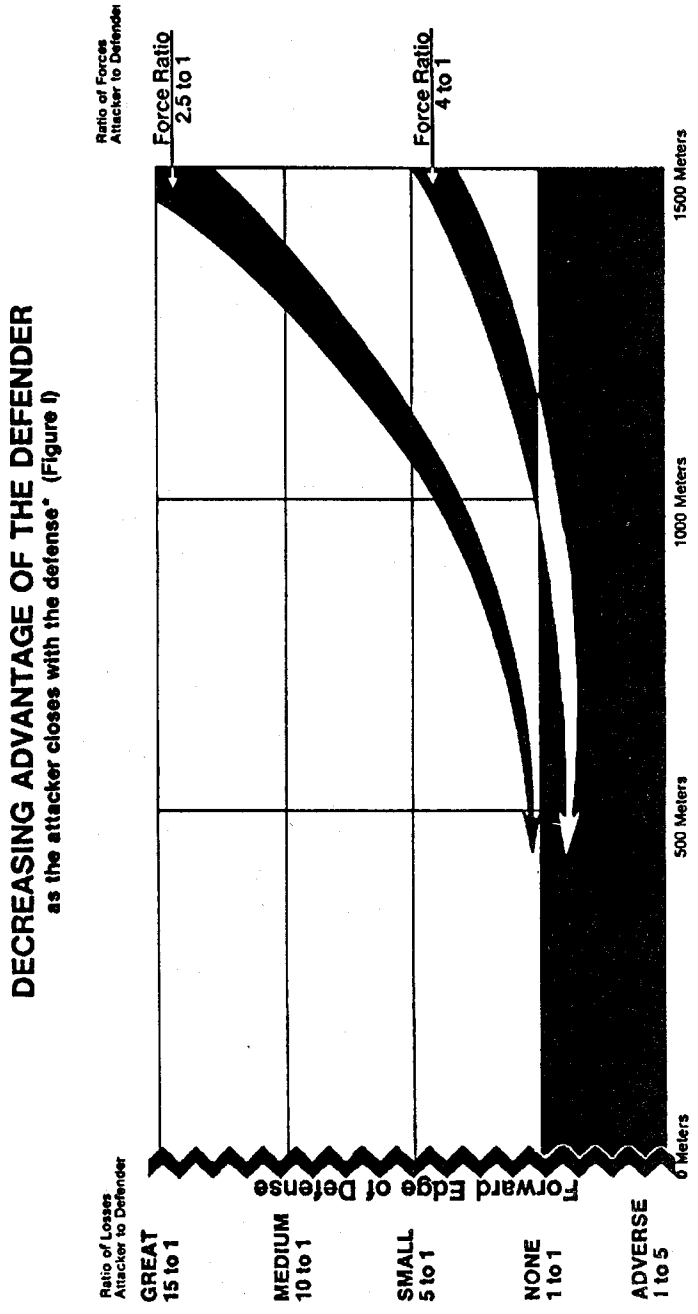
Figure I depicts the results of two battle simulations. In general, the two curves show the rapid decline in the advantages of the defender as the attacker approaches. In the battle represented by the upper curve the defender was outweighed (in combat power) by 2.5 to 1, in the lower curve by 4 to 1. Notice that as the force ratios change in favor of the attacker, the defender's advantages are of lesser magnitude and diminish rapidly to parity or worse.

Most importantly, the curves illustrate the fact that the defender's advantages are greatest (as high as 17 to 1 in the one example) at the outer ranges. Thus, if the defender can use his armored mobility to maintain distance between himself and the attacker he can preserve his advantages—in fact, he can repeat them over and over again.

The classic military response to sharply adverse force ratios has been to execute delaying operations. By stepping back to a series of rearward positions, the enemy is forced to go through the sequence of a meeting engagement one more time, with all the time delays, risks and initial losses involved. The delay has traditionally involved large steps backward, usually to major terrain features such as rivers, cities or ridge lines where the defender found pronounced terrain advantages.

In West Germany, the political and geographical tolerance for the classic delay is very low indeed. It is, therefore, necessary to seek the benefits of the delay by compressing the tactical movement into the micro-terrain of the main battle area up forward.

Even the most successful defensive operations in the main battle area would not guarantee against enemy penetrations using helicopters or airborne troops to overfly the ground defenses. Not only has this dimension of the threat been expanded by the helicopter, but, also, the Soviets are building them by the thousands. Therefore, quick reacting, equally mobile defensive forces


DECREASING ADVANTAGE OF THE DEFENDER
as the attacker closes with the defense* (Figure I)
Ratio of Losses Attacker to Defender
GREAT 15 to 1
MEDIUM 10 to 1
SMALL 5 to 1
NONE 1 to 1
ADVERSE 1 to 5
Forward Edge of Defense
Ratio of Forces Attacker to Defender
Force Ratio 2.5 to 1
Force Ratio 4 to 1
0 Meters
500 Meters
1000 Meters
1500 Meters
* Two typical battle simulations.

will be required for the security of the rear areas. Air cavalry would be a suitable complement to the more heavily armed German territorial defense forces deployed behind the fighting corps.

If concentration backed up by elasticity describes a logical set of tactical measures to exploit the military technology of the 1980s in the defense of Central Europe, the question remains as to whether there may be other even more effective alternatives.

It is surprising that someone has not proposed to build fortifications along the border between East and West Germany. In somewhat similar circumstances the Chinese built a wall, Hadrian threw up an earthwork across the waist of Britain, and the French word *Maginot* has become shorthand for futility. None of these barriers, or even former Secretary of Defense Robert S. McNamara's Electronic Wall kept the attackers out.

The attacker in each case, went over, through or around the obstacles once he decided to commit the necessary force. However, by reducing the vulnerability of the defender and thus multiplying his effectiveness, the obstacles may be said to have had some temporary value.

The problem with most of these defense systems stems first from the difficulty of concentration—there are just so many prepared positions in any one sector. The second and greater problem is that there is no elasticity to fixed fortifications so that failure of the system, when it happens, is usually catastrophic. The defense cannot maneuver and, when penetrated, the mobile attacker has a free ride. More will be said about this; in the meantime, history urges us to be wary of peddlers selling fixed fortifications as the basis of a successful defense.

More relevant, however, is the German experience against the Russians from Stalingrad to the end of World War II. For 2 1/2 years a German army of about three million men fought a strategic defensive battle against Russian armies of 5 1/2 million men which at one time disposed of some 500 divisions. No Western army but the Germans' has direct experience of such epic battles over such staggering distances.

The performance of the German Army in these circumstances was little short of miraculous. Certainly it was destined to lose in the long run for strategic reasons, but where it faltered tactically it was, as often as not, the amateur hand of Hitler on the controls. In any event, that series of battles is the closest analog in actual experience to the problems which would face NATO should the WTO attack in Central Europe.

German defensive tactics were varied according to circumstance and were often mixed, but may be classified in three general categories:

- *Linear.* Hasty or deliberate field fortifications backed by local reserves—tanks where possible.
- *Zones.* Lines of field fortifications and strong points prepared in depth within a tactical zone.
- *Mobile.* Linear screens of infantry backed by large armored reserves in depth.

The linear defenses were usually breached by heavily concentrated forces which then penetrated until they ran out of steam. Some of these penetrations were of phenomenal depth.

In the fall of 1943, Marshal F. I. Tolbukhin concentrated a force about ten times as strong as the German Sixth Army opposing him. For example, there were 83 German and 800 Russian tanks.

The Sixth Army defended the southern sector of the so-called "Wotan" line—field fortifications built by engineers, forced labor and the infantry troops themselves. The Russian attack went in on 9 October on a 20-mile front. Gen. Tolbukhin disposed of 45 divisions, three tank corps, two mechanized corps and 400 batteries of artillery. By 23 October the Russian

infantry had literally gnawed its way through the defense and Gen. Tolbukhin launched his armored exploitation force which burst forward 120 miles in eight days.

On 27 October the Sixth Army threw the 13th Panzer Division against the flank of the charging 51st Russian Army to no avail. Once the massive exploitation started to roll, the single armored division was simply shouldered aside. The failure of the "Wotan" line was total and catastrophic.

By 1944 the German armies had lost so many tanks that the defense was carried mostly by infantry. Some commanders in Poland and East Prussia conducted their defensive operations in zones consisting of several successive lines of field fortifications and strong points. This was the only technique by which elasticity could be provided for dismounted troops—troops who could not survive in the open against either tanks or artillery.

DA pamphlet 20-233, based on the views of German generals after World War II, states:

> In East Prussia the Third Panzer Army, with its nine weak divisions and only 50 tanks, 400 artillery pieces and insignificant air support was opposed to 44 Russian divisions, 800 tanks, 3,000 guns and strong air forces. The use of improvised zone defense tactics enabled the Panzer army to stop the Russian onslaught for one month, after which the collapse of the adjacent armies forced a withdrawal from this sector.

A zone of prepared lines studded with strong points, suitably supported by mines and obstacles and heavily armed with antitank weapons, is an apt description of Soviet defensive doctrine. The Soviet defense at Kursk was an example of the deep zone. Gen. Erich von Manstein fought through it—but barely. Gen. Walther Model on the north flank did not. In any event, the Germans were forced to scurry out of the bag, because of enormous Russian penetrations on both flanks of the Kursk salient.

The zone defense finds its beginnings in the German Army of World War I, which sought to provide elasticity to the dismounted infantry when confronted with massive breakthrough concentrations. On the Somme in 1916 a German army, outnumbered by the British 6 to 1 and using such a defense, inflicted 56,000 casualties among the English on the very first day—stopped the attack—and gave up its own casualties at the precisely inverse rate of 1 to 6.

Something like the zone defense is the only option if the forward defense force is not mechanized or armored. Some of the U.S. divisions scheduled for deployment to NATO in case of war are in just such a configuration. They could also serve well in the cities and towns, forests and mountains. But even the zone defense lacks ultimate elasticity. If penetrated, it, too, fails catastrophically.

The third defensive tactic, probably preferred by the German Army of World War II but increasingly beyond their capability as the war went on, could be called a mobile defense. It took full advantage of the nearly limitless maneuver space available in Russia as well as German tactical superiority.

The most spectacularly successful example of the mobile defense was a series of operations by Gen. von Manstein along the Donets River in February and March, 1943.

After closing the ring around Stalingrad in November, 1942, the Russians attacked on either flank, and after tearing a 350-mile-wide hole in the German defense (almost equal to the width of the entire NATO central front) plunged westward 300 miles, taking Kharkov in the process.

Gen. von Manstein, meanwhile, extracted 1st and 4th Panzer armies from the Caucasus; improvised a defense of his open left flank; closed a gaping hole in his center; met with Adolf Hitler who came to fire him; destroyed most of a Russian tank army which had got into his rear; recaptured Kharkov, and reestablished the line of the Donets. Toward the end of these wide-ranging operations, the 1st SS Panzer Corps thrust 120 miles into the flank of the Russian advance.

On the map three World War II operations in Russia have been superimposed on an outline map of West Germany.

At the top, a comparatively modest Russian breakthrough in 1943 by Marshal Konstantin K. Rokossovski, from the Dnieper River to the Pripet marches, is laid over the Hamburg-Bremen area.

At the bottom, a 190-mile penetration to the Rumanian border by Marshal Ivan S. Konev in 1944 is transferred to the terrain of southern Germany where it reaches from Czechoslovakia to the Rhine.

In the middle it can be seen that Gen. von Manstein's counterattack around Kharkov, had it taken place in central Germany, would have carried from Frankfurt to Hannover and across the industrial area of the Ruhr.

Free-wheeling, mobile defense operations require more space than the NATO center can afford. Any one of these operations would be regarded as disastrous by Germany.

In answer to a question on the viability of forward defense, Gen. Alexander M. Haig Jr., supreme allied commander, Europe, replied: "I think it is clear that no alliance of sovereign states can survive whose strategy would concede to an aggressor the territory and populations of some of its members."

Especially, we might add, if the nation which would give up the most is also the major contributor to the defense.

Driven by these territorial imperatives, the NATO armies have entered upon an historic effort to harmonize their tactical concepts.

The German and U.S. armies have led the way in this effort. It would be wrong to assert that all differences have been eliminated. To some irreducible extent the two armies reflect dissimilar national experiences, traditions and perspectives—even styles.

There is certainly no disagreement about the dynamics of concentration—only a sober recognition that it presents the first and greatest challenge at the onset of hostilities. Elasticity is really only one, but a most important, feature of what the U.S. Army now calls the "active defense."

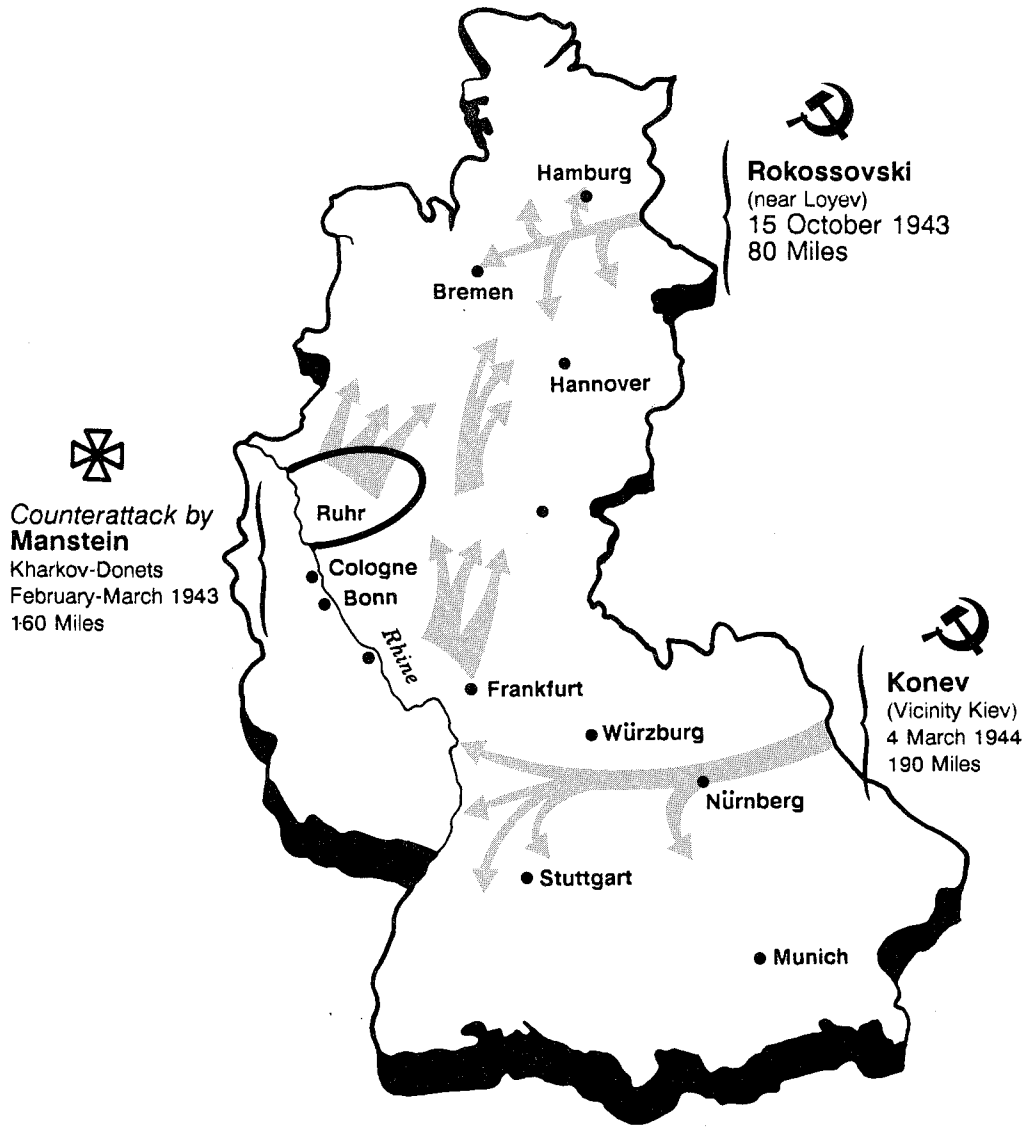
Both armies plan to commit more combat power forward. That is, they will hold less in reserve in order to cope with the heavy initial odds and thus throw more guns on line in response to the demands of the NATO forward strategy. Both armies prefer tactics which exploit the mobile firepower of armored and mechanized units. This, in turn, requires decentralization of operations with crucial reliance on the initiative and skill of thousands of junior officers.

The Germans will always worry about the possibility that its allies will use a bit too much elasticity to preserve their forces while their army uses a bit less to preserve their homeland. However, they both recognize the value of holding key terrain and will counterattack whenever the opportunity or necessity arises. On this last point the German Army has this to say:

> Counterattacks are always necessary when, in the case of deep penetrations, the *coherence* [emphasis added] of the defense cannot be maintained or restored in any other way, or when lost terrain must be recaptured.

Thus we come to the third characteristic of a successful defense: coherence.

- *Coherence*—continuous geographical and functional integrity. In its physical form coherence simply means a continuous, unbroken front. Functionally, it means much more. Modern armies like modern societies are composites of many interlocking, interdependent activities. If one element breaks down, as, for example, an electric power failure in a large city, chaos ensues.



Correspondingly, the effectiveness of an armored division conducting defensive operations against Soviet forces is very much dependent upon combat and support functions and organizations which lie outside—usually behind—the division. Air defense, tactical air support, intelligence and maintenance are good examples, but there are many others. These four functional systems extend from the battle line back through the theater of operations. In the case of intelligence and maintenance, they reach all the way back to the continental United States.

These combat and support functions are vertically integrated, increasingly sophisticated, and very vulnerable. The air-defense system consists of a carefully echeloned array of warning radars, communications, control centers and weapons. Although the most forward weapons may belong to the division commander, the system as a whole does not. It is upon the functioning of the whole system that the success of the division utterly depends.

The tactical air control system (TACS) is also a vertically integrated set of fighter units, support services, command centers, communications and control elements. The relationship with the division is one of support and coordination. The failure or disruption of this system could deny a division a large increment of combat power just when it was most needed.

The intelligence system, too, is essential to the operations of the division. The division commander has no hope of reacting to major enemy moves in time if he is confined to his own modest intelligence and information-gathering assets. The system on which he must depend extends back through all the tactical echelons to the theater level and into the United States from which very important support originates.

The intelligence system includes a rapidly growing set of advanced sensors linked with transmission, correlation and distribution subsystems. If the intelligence system breaks down at any important node, the division commander is in deep trouble.

The maintenance system likewise is echeloned and integrated so that weapons will be repaired or replaced as the battle proceeds. A failure of the maintenance and associated repair-part supply system would ground a division in a matter of a few days. In the October, 1973, war the Israeli Army processed more tanks through the maintenance system than the total number of tanks in their battle inventory.

A common characteristic of these vertically integrated semi-independent systems is that they are soft—almost totally devoid of defensive combat power when on their own. Where it might take a 6 to 1 superiority for Soviet tank units to break through the defenders in the main battle area, those same tanks could destroy support units in the rear almost at will. Additionally, the tactical air control, air defense, intelligence and service support systems are all utterly dependent upon sophisticated and somewhat fragile electronic communications and control systems. No modern Army could operate with Mongolian recruits poking around in its electronic viscera with rusty bayonets.

Earlier we said that we could not afford to let enemy armored exploitation forces into the political and industrial heartland of West Germany. Now we are saying that we cannot let those spearheads into the heartland of the field army. Coherence joins concentration and elasticity in a set of cardinal principles for the conduct of forward defense.

- *Counter-concentration*—delay, reduce or prevent enemy concentration. The last of the tactical problems is the problem of unequal reinforcement capabilities. The Soviet capability to reinforce a short-warning attack with forces from the western military districts of the Soviet Union and elsewhere in the WTO hinterland is substantially greater and faster than the movement of NATO reserves from the continental United States.

When the Anglo-American forces came ashore in Normandy in June, 1944, they were in considerable danger of being shoved back into the channel. Nine German Panzer divisions stood behind the coastal defenses in reserve. That they were not thrown into the sea was owed in various degrees to valor, deception and the isolation of the immediate battlefield by tactical air interdiction.

Of valor much has already been written. Deception froze the German 15th Army in place while waiting for Gen. George S. Patton's nonexistent army group to land near Calais. By

keeping their Panzer divisions too far back, in accordance with the experience of the German generals who had fought in Russia, the full impact of Allied tactical air superiority fell upon belated efforts to concentrate them against the beach landings. Field Marshal Erwin Rommel, after suffering under Allied air attack in Africa, wanted the Panzers moved closer to the beaches before the battle started. He was overridden.

The experience of Panzer Lehr Division was typical. Commanded by Lt. Gen. Fritz Bayerlein, once Gen. Rommel's chief of staff in Africa, Panzer Lehr was organized in France specifically to deal with the Allied invasion. Gen. Heinz Guderian, then inspector general of Panzer troops, sent a message to Gen. Bayerlein that read: "With this division alone you must throw the Anglo-American forces into the sea."

Panzer Lehr was the best equipped division in the German Army. On the afternoon of D-day, 6 June, Gen. Bayerlein was ordered to move the division forward to battle. The 140-kilometer trip took parts of two days and one night. During the day of 7 June, Panzer Lehr lost to air attack 90 armored fighting vehicles, 23 artillery prime movers and 123 trucks. On the morning of 8 June, Panzer Lehr attacked in the British sector at half strength.

The 12th SS Panzer Division, also held back too far, suffered similar losses. Thus it was that a modern and seasoned army was denied effective concentration by the interdiction of its movement and the destruction of much of its combat power in the process.

Since Normandy, the sophistication and effectiveness of fighter aircraft has increased many-fold. But, alas, so has their cost and the effectiveness of their antagonists—the air-defense missiles and guns. P-47s and 51s were bought by the thousands. F-15s and A-10s are procured in the hundreds while the Soviet armed forces have spent 20 years and enormous funds on an air-defense system aimed precisely against the effectiveness of allied tactical air forces.

Today, the number of sorties which could be allocated to deep interdiction in an effort to isolate the NATO battlefield seems disproportionately small in comparison with the threat. A repetition of the successful Normandy interdiction operation by tactical air forces alone appears unlikely.

Nonetheless, a modern tactical aircraft with a skilled pilot at the controls is the most sophisticated weapon system in existence for deep interdiction. No other sensors can compare with his eyes, nor can any processor match his discriminatory judgment. A pack of fighters which has penetrated or circumnavigated enemy air defenses and has jumped a column of vehicles moving up to reinforce the battle is probably unsurpassed in effectiveness by any other combination of systems.

Currently, long-range tactical missile and rocket systems are only partially effective interdiction systems because of a combination of target-acquisition difficulty, target-location error, delivery accuracy and, most importantly, marginal warhead lethality. Lest anyone be offended by the introduction of the cost factor, it is only meant to say that heretofore it has been more sensible to put available resources on tactical air forces and direct-fire weapons for the forward line.

Now there seems to be a reasonable chance that effective interdiction by ground delivery systems can be revived through precision guidance techniques applied to submunitions delivered into the target area by rockets and missiles, themselves guided most of the way. High-technology sensors will soon be put into the field which can locate hard and moving targets within delivery system accuracy requirements. Automatic target information processing, including the correlation or fusion of multiple sensings, can reduce the interval between acquisition and attack to workable limits.

The use of terminal guidance for submunitions relaxes somewhat both the time constraints and the accuracy requirement for the delivery systems. There seems little doubt that all this can be done from a technical standpoint. Just how it will work on a dirty and disorderly battlefield remains to be seen.

Remaining also to be seen is whether the technical capability will be converted to a serious war-fighting capability or will remain an interesting demonstration. The counter-concentration function is so important that competition between terminally guided submunitions delivered by rockets and missiles and tactical air forces (perhaps also using similar munitions) should be encouraged and sustained. As a practical matter, we will probably see a mixture of the two on the future battlefield.

Conspicuous by its absence in connection with counter-concentration operations has been any discussion of nuclear weapons. Where the terminally guided submunitions may prove to be a viable weapon in counter-concentration, the neutron weapon almost surely would be.

But the employment of tactical nuclear weapons—the conduct of sustained tactical nuclear operations—requires a coherent defensive system fully operational, both horizontally and vertically. It is specious to think that tactical nuclear weapons can be brought into the midst of disaster and somehow turn the tables. The nuclear option on the central front of NATO depends not only on the security and free operation of the delivery means but also the efficient operation of the battle management system from sensors, through communications, to processors, decisionmakers and delivery systems and back and forth, over and over again.

The integrity and coherence of the total defensive system must be maintained or the tactical nuclear weapons could never be delivered on the right targets at the right time.

So what does all this mean? Does it mean that such a concept of defense and its operational measures will guarantee the successful defense of NATO? Does it mean that clever tactics, cleverly exploiting high technology weapons will relieve the NATO allies of further painful effort, worry and expense? No, it just means that commanders on the spot must conduct the defense in the light of these realities. Scientists, engineers, defense managers and political leaders also should understand these principles and the tactics, weapons and risks associated with them.

Lastly, it means that strategies of deterrence are not sufficient for fighting battles if deterrence fails. Knowing how to fight, and preparing along those lines, is the only real basis of deterrence. As Gen. Erich Ludendorff once said, "A strategical plan which ignores the tactical is foredoomed to failure."

3

'One-Up and Two-Back'?

By Gen. William E. DePuy
U.S. Army, Retired

Battle tactics have traditions like everything else in the Army. Yet, sometimes science and sometimes genius show us there might be a better way to penetrate the enemy's lines than what we've been taught.

Everyone knows that is wrong—or is it?

"Two-up and one-back and feed 'em a hot meal" had been the first law of infantry tactics for as long as anyone can remember. Thousands of aspiring lieutenants armed with little more than this marvelously simple rule of thumb passed their examinations at Ft. Benning, Ga., and proceeded to careers of varying distinction. It is the purpose of this discussion to suggest—indeed insist—that we have had it backward all along.

But first we must narrow our field of view. The question becomes most interesting in the context of the attack, even more specifically the assault. This will be the focus. We have argued elsewhere that in the defense just the opposite is true and necessary. Three-up, or four-up and one-back is forced upon a numerically inferior but highly mobile force. But this is a diversion—back to the attack.

If there is one strong image on the mirror of our collective military minds, it is that of the long, thin line of troops making its gallant and bloody way forward against the murderous fire of an entrenched enemy. Cecil Woodham Smith enforces this image in writing of the Crimean War in *The Reason Why*:

> But the Grenadiers and Coldstreams though under deadly fire formed into line with as much precision and lack of hurry as if they had been on the parade ground, and began deliberately to advance up the glacis towards the Great Redoubt . . . storm after storm of bullets, grape, shrapnel, round-shot tore through them, man after man fell, but the pace never altered, the line closed in and continued ceremoniously and with dignity.

As late as World War I, infantry drill regulations were designed to bring large bodies of troops on line and to keep them on line as they advanced into the fire of the defenders. What has since become mere ceremonial drill was then, and for centuries before, the heart of discipline and tactics.

"Squads right!" and its reciprocal command, "Squads on right (or left) into line!" made for snappy formations in the armories and on the parade ground but were, in fact, methods for converting battle lines into columns and back again as the flow of battle and the lay of the land might require. At bottom, it was the technique of massing combat power on the critical part of the battlefield at the crucial time.

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Combat power before World War I grew out of the barrels of many guns—muskets and rifles and small artillery pieces. To mass combat power, one must mass men. The two were synonymous.

Thus, tactics consisted of orderly, efficient and reliable techniques of concentrating large numbers of men in small areas in such a manner that they could present the maximum number of weapons to the enemy; in short, a closely packed line.

As artillery improved toward the end of the Napoleonic wars this technique began to produce enormous casualties. The American Civil War was an even more dismal bloodletting. The whole process culminated in the ultimate horror of Verdun in World War I. Even the somewhat extended ranks of the Great War could not withstand the havoc wrought by a combination of high explosives, shrapnel and the scything effects of the machine gun.

The response of the participants to the failure of Napoleonic tactics on an enormously lethal battlefield came in a variety of forms, some well-known, one more obscure.

Some Allied commanders, most notably the British, decided to retain the tactics of the assault in line but to reduce losses by the simple expedient of destroying the defenders by the employment of astounding masses of artillery firing millions of rounds until the enemy was reduced to impotence—utterly destroyed. It did not work.

The German Army dug deeper and devised an elastic defense in depth which resulted in the debacle at the Somme in 1916 when 56,000 British troops fell on the first day alone. Followed by Passchendaele, the British were shocked and dismayed.

Almost in desperation, Field Marshal Douglas Haig turned to the tank. Used prematurely in small numbers on the Somme, the tanks had nonetheless shown promise at Arras. Detailed planning was in the hands of the famous Col. J. F. C. Fuller. A force of nearly 500 tanks led the attack on Cambrai in late November, 1917.

At first a smashing success, the attack opened a seven-mile-wide breach and collected 16,000 prisoners. But the lack of experience in tank-infantry cooperation combined with the mechanical frailty of the machines themselves finally caused the battle to grind down with little gained in relation to the effort expended. Nevertheless, a new era was born and war would never again be the same.

The German Army after Verdun also developed a new tactic for the attack of strongly defended and fortified lines. It was still a broad front attack, but, instead of stand-up waves of soldiers advancing generally in line, the German attackers moved in small groups which endeavored to use the cover of the terrain—to find holes and weak spots in the defense—to bypass resistance and to press on deep into the rear of the defenders, a massive infiltration by thousands of small elements.

Employed with enormous success against the Russians at Riga, it became the basis for retraining the German Army in preparation for the last great offensive in 1918. Even though its first application destroyed the British 5th Army, it failed in the end because the means of deep and decisive exploitation were not available. They did not even exist in those days.

A series of additional attacks, including the second battle of the Marne, also failed to produce the decisive results sought by Erich Ludendorff and so desperately required by a tired Germany. The Allied counteroffensive ended the war.

But tucked away in the folds of that long and brutal war another technique was raised to an incredible level of effectiveness by the remarkable Erwin Rommel. He brought to modern tactics the difficult art of direct-fire suppression during the critical assault phase of the attack. We will return to this fascinating performance and its implications in a moment.

We must dismiss the strong temptation to follow the tactical evolution which grasped these several lessons and wove them into the fabric of a whole new doctrine—one which produced the panzer *blitzkrieg* of World War II. But we have a more modest purpose and return to the realm of Lt. Rommel and his enormously effective tactics while fighting in France, Rumania and Italy in World War I.

In 1937 Rommel published the first edition of his war experiences under the title *Infanterie greift an.* His stories and his tactical successes are awesome. Undoubtedly it would be possible to find doctrinal explanations in German Army tactical manuals of the time for the particular technique of combat which he applied so successfully. But the degree and manner of its application was uniquely his.

His tactics were distinguished by the masterful use of direct-fire weapons to gain nearly total fire superiority over his opponents in narrow sectors in order to effect a breakthrough as a prelude to penetration and victory.

Rommel went to war, and remained throughout, with the Württemberg Mountain Battalion, by any measurement a remarkable fighting unit. From the beginning, he displayed such unusual tactical sense and initiative that he quickly became a key leader and by the end of the war, still a first lieutenant, he came to dominate the operations of the battalion, and even, on occasion, of the Bavarian Alpine Corps to which it belonged.

In Belgium and France as a platoon leader and company commander he was subsumed, so to speak, in the tactical practices and wisdom of the times. In the difficult fighting just west of Verdun and in the Argonne he followed artillery barrages into the French defenses with a boldness and dash rare even among the excellent mountain troop leaders.

But when the mountain battalion was sent into its proper environment, in the hills and mountains of Rumania and Italy, Rommel's genius for war found full scope for its application. It is in the nature of mountain warfare that artillery support is modest at best and often not available at all. Consequently, the mountain troops were often on their own—dependent upon the weapons they could carry and usually battling against larger forces entrenched on higher ground.

The mountain battalion was a formidable organization when compared with current battalions. It consisted of six mountain rifle companies and three heavy machine gun companies. As a detachment (task force) commander Rommel as often as not found himself commanding about half of the battalion with constantly changing mixes of rifle and machine gun companies.

The German Army was parsimonious in respect to promotions. Still a first lieutenant, Rommel was sometimes given operational command and control over entire battalions from adjacent regiments—this in addition to his own battalion-size task force.

Rommel possessed that cherished attribute which the Germans call *Fingerspitzengefühl*, an uncanny ability to assess the opportunities inherent in the situation and the terrain. He relied heavily upon direct fire suppression and used it surgically to effect breakthroughs. He practiced rapid exploitation and exercised personal control over every action.

The year 1917 provided him the full opportunity to develop and to display these techniques. (Table I shows certain selected features of five illustrative operations.)

He habitually organized his force into three functional components: a suppression element, an assault element and the exploitation force. Whenever possible, which was almost always, he personally assigned both positions and targets to every machine gun in the suppression element. The assault element was small in relation to the suppression element and became progressively smaller as he gained experience. The exploitation force was normally the largest.

Table I. Examples of Rommel's Infantry Battles in 1917

Date	Place	Size Force	Suppression Element	Assault Element	Exploitation Element	Ratio Support to Assault
1/7/17	Gagesti Rumania	1 rifle co. 1 MG plt.	1 rifle plt. 1 MG plt.	1 rifle plt	1 rifle plt.	2 to 1*
8/10/17	Carpathians	3 rifle cos. 2 MG cos.	1 MG co.	2 rifle plts.	2 rifle cos. 1 MG co.	3 to 2
8/11/17	Carpathians	3 rifle cos. 2 MG cos.	1 MG co.	1 rifle plt. 1 rifle sqd.	2½ rifle cos. 1 MG co.	3 to 1
8/19/17	Carpathians	3 rifle cos. 2 MG cos.	1 MG co.	1 rifle sqd.	2⅝ rifle cos. 1 MG co.	9 to 1
8/25/17	NE Italy	3 rifle cos. 3 MG cos.	1 MG co. 6 light MGs	4 rifle sqds.	2⅔ rifle cos. 2 MG cos.	4 to 1

*One MG platoon equals one rifle platoon (a conservative estimate of MG effectiveness).

Rarely did the assault group have more than 100 yards to travel between its covered attack position and the breakthrough point. In all cases shown, the suppression was sufficiently effective so that the assault force went in virtually standing up, without casualties, and then split laterally to work with rifles and grenades to widen and secure the breach.

In most cases, Rommel personally led the exploitation force through the breach into the depth of the enemy position, directing each platoon or company to objectives in accordance with the unfolding situation.

It can be seen from the table that in all but the first battle Rommel was commanding a battalion-sized force. As time went on he came to prefer "weak" assault forces. On 19 August an entire heavy machine gun company opened the way for a single squad in the assault, followed by the remainder of the battalion in exploitation.

Certainly these attacks are the antithesis of the long, thin, bloody line. Rommel had learned an important lesson: the principle of concentration applies just as decisively at the company and battalion levels as at the division or corps.

It is not difficult to discern the application of this lesson to the operations of the 7th Panzer Division in France in 1940 or of the Afrika Korps in the following two years.

Looking back over our own performance in World War II, Korea and Vietnam we are bound to ask whether the U.S. Army has embraced this key to tactical success. Certainly some commanders in some units understood and applied direct-fire suppression with skill and imagination. However, the net assessment surely must be that we have not brought this technique into the heart of our doctrine and practice.

Perhaps we need more recent evidence. Lt. Rommel's experiences were exciting, but, after all, World War I was a long time ago.

We might consider some fascinating parallels between the Rommelian techniques and those practiced by the Vietcong and North Vietnamese during that unmentionable war in Southeast Asia. There were, of course, hundreds of VC and NVA attacks against strong points or perimeters such as fire bases, Special Forces camps and district towns. *Almost without exception*, the

attacking force consisted of a suppression element, an assault detachment and an exploitation force.

Ask any Special Forces trooper, district advisor or infantry commander who survived such an attack and he will almost certainly tell you that the battle started with very heavy direct-fire suppression against the defensive positions in a particular narrow sector of the perimeter. The weapons used were recoilless rifles, RPGs and machine guns. Mortar fire fell on the interior of the position to discourage redeployment toward the threatened sector.

The next move was by a small assault detachment with the mission of cutting the wire or employing bangalore torpedoes. After the breach in the wire the assault detachment would attack the nearest bunker—those covering the breach—with hand grenades and explosive charges. This done, the exploitation force charged through the gap into the interior of the defended position.

On many occasions the defenders could actually hear the suppression element digging weapons positions a scant 50 to 100 yards from the wire or perimeter some time before the attack.

The Israeli Army drills incessantly in almost identical techniques designed to reduce Soviet-style desert strong points of the kind employed by the Egyptians and Syrians in 1973. The suppression element includes tank guns during daylight attacks and RPGs, machine guns and recoilless rifles in any event. The assault force may be engineers using special equipment or infantry formations similarly trained.

The techniques for working outward from the point of breach along the line of trenches and dug-outs have been standardized and have proved to be effective in several wars. Exploitation into the depth of the strong point is routine.

Soldiers have always been accused of preparing for the last war. In this case we could be accused of preparing for the last war twice removed plus one or two intervening affairs. But the evolution of weapons and tactics is a continuum. As in navigation, it is easier to know where you are if you also know where you have been.

Now at last there are very modern methods for simulating many of the critical features of combat in order to find the best tactical solutions without waiting for that next war. In 1976 at Hunter Liggett Reservation, Calif., the Army's Combat Developments Experimentation Command (CDEC) conducted a long series of laser engagement simulations with infantry units in the attack and defense.

CDEC has this to say about such simulations: "The experiment marked the first time that a force-on-force infantry experiment had been conducted with realistic real-time casualty assessment. Methodology for simulating (with lasers and associated instrumentation) rifles, automatic weapons, grenade-launchers, antitank weapons, hand grenades and indirect-fire weapons was employed. The technology developed for this experiment opens up almost unlimited possibilities for future infantry field experiments."

In the mid-1970s Ft. Benning prescribed a whole new concept for infantry positions. Designed to defeat the direct suppressive fire of an attacking enemy, the defensive positions were to be dug behind some form of frontal cover—a rock, tree or hummock, or where no such natural cover existed, behind a parapet to be constructed from the spoil excavated in the course of digging-in.

Used with stunning success by certain units in Vietnam, this technique was only partially—perhaps reluctantly is a better word—accepted by the infantry noncommissioned officers.

Requiring, as it does, that the soldiers in each two-man position fire to the right and left at about a 45-degree angle across the front of adjacent positions, this system of defense involves a

high degree of mutual interdependence. The protection of each position from a direct frontal assault depends upon the fire from the positions on either flank.

The benefit derived from the system, of course, is that these interlocking positions can continue to engage the advancing enemy even when they are receiving suppressive fire from the front. The inability to see directly to the front during the enemy assault reduces casualties, but produces anxiety, especially among the sergeants, many of whom apparently would rather take their chances with the enemy fire while looking and fighting to the front.

It was for these reasons that CDEC was asked to evaluate the parapet foxhole. Troops from the 7th Division at Ft. Ord conducted some 70 trials in which a platoon of infantry armed with laser engagement simulators on each weapon, in a highly instrumented environment, attacked a rifle squad similarly equipped using three different foxhole configurations.

The first was the good old hole in the ground called standard. The second was the parapet foxhole as described earlier. The third was a so-called split parapet in which there was a slot in the middle of the parapet through which the soldiers could see and shoot either to the front or obliquely from behind the cover of the two "humps."

The more important findings were as follows:

- "Based on the casualty exchange ratio, the parapet and split parapet foxholes are more than twice as effective as the standard foxhole in the daylight defense."
- "The soldier prefers the split parapet foxhole over both the standard and frontal parapet foxhole."
- "The attacker *fired three times as much ammunition* against the parapet foxhole as against the standard foxhole *to achieve the same number of hits.*"
- "*Use of two fire support squads and one maneuver squad was more effective in penetrating all types of prepared positions than the use of one fire support and two maneuver squads.*"

This last finding was a bonus. While looking for one thing, as is so often the case during scientific experiments, the Army found something else of equal importance.

More specifically, it was found that a formation of two up and one back—that is, two moving and one shooting—penetrated the defense only 25 percent of the time. But when the ratio of movers to shooters was reversed—that is, two shooting and one moving—the defense was penetrated 87 percent of the time.

The fact that the CDEC experiment could be used to support the one-up and two-back thesis is not the point. In fact, that formula appears to be much too conservative; nine to one may be an extreme ratio but that seems clearly the way to lean.

This conclusion is pure Rommelian. From the standpoint of the fighting army these findings surpass in importance almost any issue one could name, from SALT II to the draft.

With respect to the configuration of the foxhole, Ft. Benning now recommends that the hole behind the parapet be extended to the flank so that when the position is not under suppression and at night the soldier can see to the front and fight to the front.

When the suppression begins to come in hot and heavy on the position, the soldier can avail himself of the protection of the parapet (or rock or tree) while continuing to participate in the defense actively with his weapon.

One obvious problem with the split parapet is that neither rocks nor trees are easily configured in the split mode.

So far we have been talking about the operations of light infantry. Can we fairly extend our findings into the realm of mechanized and armored warfare? There are reasons to believe that the answer is a resounding and indispensable yes.

In the first place, armored forces are designed around mobile firepower. In World War II, the light armored divisions possessed no more than three armored infantry battalions, compared with nine in the infantry divisions. In the more skillful armored divisions, the scarce infantry resources were employed whenever possible within the protection of the fire envelope of the armored task force to which they belonged.

When it became necessary to clear a roadblock, seize a village or secure an exposed flank so that the armored force could continue on its main mission, the armored infantry assault was supported by the fire of all available weapons in the tanks and armored infantry vehicles of the force as well as the indirect fire of artillery and mortars.

These operations were firepower intensive. The ratio of suppression to maneuver was habitually high. Exploitation was the name of the game.

When the German Army speaks of "panzer grenadiers," they are thinking of just this kind of relationship and this kind of combat technique. Because of the special relationship between armored infantry and tanks within the framework of an armored task force, the Germans have given their armored force the responsibility for the doctrine and training of panzer grenadiers. The light infantry remains separate at the infantry school at Hammelburg.

The U.S. Army wisely decided not to follow the German lead, although it was considered carefully at one time. Having fought in Korea and Vietnam primarily with infantry battalions, the bulk of the Army's seasoned maneuver commanders have risen to eminence in the infantry branch. The solution was to build on that base of excellence by training light infantry officers and NCOs in mechanized infantry tactics and techniques. This process is well under way but has not been completed. The last three commandants at Ft. Benning—all distinguished infantrymen—have had extensive command experience with mechanized units. A mechanized infantry vehicle now stands in front of Infantry Hall at Ft. Benning.

But the difficult and time-consuming process of comprehending the basic nature of mechanized infantry tactics (panzer grenadier style) is vividly demonstrated by the stormy and uncertain history of the Army's effort to develop an infantry fighting vehicle over the last decade. The development of what has now been called the XM2 has been a technical and conceptual running gunfight.

There have been a number of constituencies which have brought their more or less helpful influence to bear on the problem.

The Army's initial description of the XM2 (then called the MICV) included requirements based on a tactical scenario in which the MICV was pitted against its Soviet counterpart, the BMP. The idea was that the MICV gun must be able to defeat the BMP armor at longer ranges than the reciprocal capability of the 73-mm recoilless weapon on the BMP.

Of course, it was not just the BMP, but also the tanks and antitank guided missiles that could kill infantry vehicles on both sides. This aspect has led to heated differences regarding the vulnerability of the MICV. To meet the requirements of defeating the BMP and also to provide a powerful weapon against dismounted enemy infantry the Army specified that the MICV would have a dual-purpose automatic cannon, which it named the Bushmaster.

The vehicle itself was to be armored against .50-caliber weapons, be able to fire on the move by virtue of a stabilized turret, carry a pod containing two TOW ATGM, swim and have cross-country mobility compatible with the new XM1 tank.

Several secretaries of defense were skeptical about the MICV for a number of reasons, not the least of which was that it was going to cost more money than one normally associated with the infantry—doesn't the infantry fight on foot?

Defense analysts, preoccupied with the Russian tank threat, wished to convert the MICV into a primary tank killer. This tendency was reinforced by the fact that the simulation models available to the analysts were never able to cope with the complexity or even the role of the mechanized infantry, and focused only on the battles between tanks and antitank weapons. For years all the simulated war games ended with one side or the other defeated before the first infantry became involved.

Congressional committees were somewhat bewildered by all this, plus the fact they could always find witnesses who said that the Army did not need such a vehicle in the first place, and if it did, the MICV was not the vehicle.

Conspicuous by its absence in all the debate was any meaningful discussion of its primary roles and missions as an infantry fighting vehicle.

In defense—hull-down or dug-in—the firepower of the Bushmaster alone exceeds the firepower of the whole squad against dismounted attackers. The armor-piercing round can destroy light armored vehicles. The antitank guided missiles can overwatch and protect advancing tanks.

In the attack the XM2 can escort and protect tanks by suppressing or destroying dismounted enemy infantry armed with antitank weapons. Lastly and importantly, the XM2 can make the difference in the execution of the most difficult aspects of the active defense.

Carrying only nine soldiers when at full complement, and leaving behind at least a driver and gunner, the dismounted squad will probably average no more than five men in actual combat. A platoon of 20 men and a company of 70 or 75 on foot with light weapons will not have the capability to maneuver independently in heavy combat. *But* that platoon or company, like Rommel's "weak" assault element, supported by a dozen or more XM1s and XM2s in the suppression role, can overcome enemy dug-in positions standing in the way of the armored force.

The stabilized and armor-protected 25-mm Bushmaster is ten times as effective as the standard infantry machine gun in the suppression role. A single platoon of four XM2s is thus the firepower equivalent of 40 standard infantry machine guns. How Rommel's mouth would have watered!

The ability to defend NATO requires a military force that can move on the battlefield. Even though the strategic mission may be defensive, the tactical situation may require the attack. Mechanized forces may find it necessary to attack to seize the battle positions from which to defend—to counterattack to regain critical terrain if it is lost—and to attack whenever that mode is the most effective way to accomplish the overall mission and to destroy the enemy force.

If there was ever an army that needed an alternative to the long, thin line with its high casualties and dubious prospects it is the weapons-intensive, manpower-starved, all-volunteer Army of the 1980s.

4

FM 100-5 Revisited

By Gen. William E. DePuy
U.S. Army, Retired

One of the principal authors addresses some of the criticisms that have been directed at a widely discussed field manual whose publication five years ago was heralded as signaling a 'renaissance' in tactical theory and practice.

When *Field Manual 100-5, Operations*, was published in June, 1976, the authors were driven by certain events and forces then at work:

- The Vietnam war—combat with light and elusive forces—was over.
- The defense of central Europe against large, modern, Soviet armored forces once again became the Army's main—almost exclusive—mission.
- The Arab-Israeli War vividly illustrated the lethality of modern weapons and the high value of crew proficiency and the skill of tactical commanders.
- A decade of war was to be followed by a decade of intensive modernization. *FM 100-5* and its first two offspring—*71-1* and *71-2*, the operating manuals for company and battalion commanders, responded to these influences along the following lines:
  - The focus was mainly on combat in Europe.
  - The accent was on armored and mechanized warfare.
  - Soviet forces were recognized as the enemy and Soviet tactical doctrine became the immediate center of attention.
  - Weapons characteristics, trends and applications were emphasized.
  - Superior concentration of combat power in the attack and in the defense through good intelligence, quick decision and high mobility was described as the only solution for an outnumbered force.
  - Operational and tactical concepts were designed to cope with Soviet strength and the lack of maneuver room in West Germany. Those tactics could best be described as an elastic defense combined with counterattacks in order to defend along and close to the border of West Germany.
  - The bulk of the force was pushed forward. Reserves were, therefore, relatively smaller than normal. Coherence was to be maintained and penetrations avoided if possible. All in all, it was a tall order.

We are now in the fifth year since *FM 100-5* launched a substantial renaissance in tactical theory and practice throughout the Army. Experience has been gained in training, in exercises and war games, as well as in operational planning.

From *Army* 30, no. 11 (November 1980): 12—17.

Based on that experience, the Army is in the process of reviewing its doctrine, a wise thing to do. Doctrine is a somewhat circular enterprise. It must inform and instruct the Army on how to operate, but it is not really doctrine unless it also expresses the manner in which the Army actually goes about its business. In short, to be doctrine it must "take."

There is evidence that some of the doctrine set forth in *100-5* has not taken hold throughout the Army in the manner intended. Concern with the doctrine in *100-5* has been expressed both within and from outside the Army. Interestingly, there has been almost no discussion of offensive doctrine; rather, attention has been centered exclusively on the defense. This may be because the offensive doctrine is fully accepted, but is probably because the Army is so deeply absorbed in the highly visible mission of NATO defense.

Criticisms often heard within the working Army include statements such as these: "The defensive doctrine is too reactive—the enemy calls the tune." Or, "There is too little offense in the defense. Or put another way, too little action in the active defense." (The term "active defense" is mentioned only once in passing in *100-5* as an adjective and seldom in *71-2*. However, in *71-1* "active defense" becomes the official descriptor of the defensive doctrine set forth in this family of manuals, although, as we shall see later, there is no consensus on the meaning of that term.)

One also hears, "The defense does not adequately exploit the less flexible and more centralized procedures of the Russians by retaining the initiative and by confronting him continuously with new situations to which he will find it difficult to respond," and, "The defense does not actively integrate fires with maneuver to shape the battlefield in ways advantageous to the defender."

Lastly, and most importantly, the active defense is regarded by many officers simply as a delay triggered by the mere appearance of the enemy on the battlefield.

Criticism from outside the Army falls into two interrelated categories:

First, is the feeling variously expressed that the U.S. Army relies on attrition even though it has lost the relative superiority which would make that option a viable choice.

Second, that in any event, attrition is a pedestrian approach to war. Maneuver tactics are the way to go and the only sensible course of action for a small force badly outnumbered.

As one of the principal authors of *FM 100-5*, there is some temptation to quote extensively (and selectively) from the manuals to show that the critics are wrong. However, each criticism has enough substance and merit to deserve—indeed, demand—careful consideration.

The remainder of this discussion takes up the criticisms and offers some thoughts on their causes and remedies. At this point it is no longer possible to avoid saying that all this may be quite presumptuous for an old soldier no longer in the king's employ. But it is hard to walk away from a problem so central to our prospects for winning battles and winning wars. So first for the concerns of the working Army.

The intention of the defensive doctrine was to employ a variety of tactical methods in the service of the mission. For example, *71-1* explicitly supports the idea of a diversified defense: "Although the overall operation may be defense the [company] team can expect to execute almost any kind of combat action . . . attack, block, defend a specified piece of ground, delay, withdraw or move rapidly from one part of the battlefield to another as part of a concentration of force" (*FM 71-1*, Pages 5-15).

Certainly, a very large number of our most thoughtful and tactically skillful officers understand fully the logic and necessity for a diversified defense. However, if any substantial number of officers translate the active defense narrowly and exclusively as a delay then the other tactical options are nullified and the concept of the diversified defense is rendered ineffective.

In this case, the criticisms of our doctrine must be declared valid. More than one division commander judges this to be the true situation.

Certainly, we need to know how and why this wide divergence in the interpretation of defensive doctrine has come about. There are no doubt a number of reasons. However, we will assert that three appear to be prime movers:

- Imprecision in the definition of active defense.
- Imputing inevitable success to Soviet offensive tactics.
- Uncritical acceptance of war-game results, especially the unrealistic tempo of action and steady, inexorable rates of advance.

It is not entirely clear, upon careful reading of the doctrinal manuals, whether the "active defense" is meant to describe the total package of tactical options open to a commander with a defensive mission, or whether it is more specifically confined to the concept of elasticity in the face of a very large enemy attack. A case can be made for either interpretation, which suggests a troublesome ambiguity on a fundamental point.

It is clear, however, that all three of the key manuals tilt heavily toward a defensive concept which involves "the utilization of successive battle positions, in depth, to wear down and weaken the enemy, followed by counterattacks" (*FM 100-5*, Page 12).

It seems probable, in retrospect, that the emphasis upon this particular solution—an emphasis geared directly to the Soviet breakthrough tactic—has worked to crowd out the other options and has expanded beyond the breakthrough situation to dominate tactical thought in other circumstances. If the terrain is critical to the overall conduct of the defensive battle, or is especially well adapted to the defensive purpose, the commanders may decide to avail themselves of other tactical options such as strongpoints, more deliberate defensive works or, in some cases, traps, ambushes or spoiling attacks.

The second prime mover comes from an equally respectable source. The very valuable manual on Soviet operations published in April, 1978, as well as most of the other intelligence products presented to the working Army over the past five years, strongly conveys the idea that Soviet forces in the attack are irresistible in their forward movement.

If elasticity is to be displayed in the face of overwhelming attacks, and all attacks are thought to be overwhelming, then all commanders would always choose to give ground. The cumulative effect of this logic is distressingly obvious.

The great detail in which Soviet doctrine arranges the echelonment of forces—the distances and times separating the successive elements—the schedule of their commitment and the desired rates of advance presents a picture of invincibility, of certain success. But these are only goals and hopes, presented in a tactical vacuum. The enemy is not present or, if he is, submits willingly as a training aid. We are not unfamiliar in our Army with this kind of preparation for battle.

But war is not like this. The enemy is present, the terrain is difficult. Things go wrong. The doctrine runs into practical difficulties.

Surely, the choreographed Soviet doctrine—the intricate offensive minuet—is especially subject to frustration by a flexible, wily and tough defender.

The last major influence which has probably furthered the tendency to go quickly and uncritically to the delay has to do with the war games we play for training purposes.

War games are notorious for playing at too fast a tempo. Few of the games take into account such dampening mechanisms as troop-leading times, friction in execution such as errors, stupidity, fear and incompetence. All weapons are manned by perfect crews; that is, they extract

the full design potential from weapons. Small-unit tactical leaders are assumed to be able to deploy all their weapons during all engagements so that every one bears upon the enemy.

In fact, crews in war are lucky to realize 50 percent of their weapons potential and tactical leaders would be unusually skillful if they could bring half their weapons to bear. And, as we all know, Murphy's law runs rampant.

The net effect of all this is that most war games run at least three times faster than they should, move forces at three times the actual rate and consume ammunition and produce casualties on a commensurately unrealistic basis.

Unfortunately, all of these war-game characteristics feed the image of overwhelming Soviet attacks. It is a good war-gamer who can move backward fast enough to avoid annihilation.

Quite obviously, every Soviet attack is not a concentrated breakthrough effort. Indeed, some experts argue that such attacks will be the exception rather than the rule. Logic tells us that where breakthrough concentrations are achieved, the greater portion of the front will see secondary efforts.

Obviously, too, there is no such thing as a constant rate of advance when viewed from a single sector at a particular time. Soviet armies do not move forward on some magic cruise-control set at 15 kilometers an hour or some other rate derived by averaging movement over periods of days and weeks. Instead, battles are episodic, advances sporadic, and subject as much to the terrain and the quality of the defense as to the doctrine of the attacker.

Just because we have studied Soviet doctrine exhaustively, we must not sanctify his intentions nor assign his tactics an aura of inevitable success.

A well-situated, well-supported U.S. tank or mech company with ten to 15 high-performance tank and antitank weapons should be able to destroy a Soviet tank battalion coming straight at it nine times out of ten with moderate losses.

If that Soviet battalion is operating as part of its parent regiment advancing in the sector of a U.S. battalion task force, and if that defending task force is even reasonably competent, then the Soviet regiment should also be destroyed forward of the battle position.

In these circumstances, elasticity in the form of giving ground is not required, but full exploitation of the inherent advantages of the defender is more than ever required.

Thus, elasticity at the nose of the enemy's main effort at the beginning of the onslaught does not automatically require elasticity later when the attack is spent, or elasticity elsewhere.

It is fair to ask here just how the company and battalion commanders are to know whether they are deployed across the nose or on the flanks of the enemy's main effort. Central to the concept of success when fighting outnumbered is to see enough of the battlefield so that division and brigade commanders can make these determinations just as they must determine where and when to concentrate their forces. This requires the brigade commander to tell his battalions what tactics to employ as part of his concept of operations, such as "Hold here!" "Give here!" "Counterattack there!" Concepts well tuned to the mission, the terrain and the enemy will surely call for diversified tactics.

This conclusion prompts a word about counterattacks. *FM 100-5* is cautious about leaving behind the advantages of the defender in order to venture out in the open in counterattack. This may well be true of a head-on counterstroke but too cautious in respect to counterattacks in general. A well-executed counterattack falling on the flanks or rear of an enemy force just as it suffers a severe check in front has often been spectacularly successful.

The vulnerability of a force oriented both physically and mentally in one direction to an attack from another direction is extremely high. The cover is to the front, but the fire is from the flank; the tactical disposition is to the front, but the threat arrives on the flank; the mind is fixed on one plan, but the situation demands another. These conditions can set the stage for annihilation.

Only the commanders on the ground, operating within the context of their mission and in accordance with the concept of their higher commanders, can exploit the full range of available tactics and techniques to achieve success. Only the commanders on the ground, not the doctrine of the Army, can be allowed to narrow their choices because of the infinite variety of terrain and situations with which they will be confronted.

The authors of the next edition of *100-5* have the important task of broadening the options by clarifying the doctrine. It may be that the term "active defense" should be clearly broadened to make it synonymous with diversity—dynamic diversity. On the other hand, they may wish to discontinue the term entirely, as it now carries some confusion in its intellectual baggage, and simply refer to "operations for defensive purposes."

But, in either event, the option of elasticity must be preserved. The last thing we want is to throw that baby out with the dirty bath water.

In the face of a narrow breakthrough attack, the choice may be between elasticity or a shattered defensive system—a deep penetration into the heartland of industrial and political Germany and Soviet tank divisions on the rampage in the midst of those supporting echelons upon which the forward defense utterly depends. If we retain, as we must, the classic meaning of the other tactical options (delay, withdraw, deliberate defense and so forth), and if the active defense is either broadened and diversified or discarded, then we are left with no good description of the tactic of elasticity.

The easy answer is to lump the idea under the "delay." Unfortunately, the intent of the delay (to gain time) is not the intent of elasticity (to slow, stop, destroy). The authors must clarify this fundamental point in such a way that the mobility of armored and mechanized forces is exploited as much in the defense as in the attack. The smaller force must use all the advantages which accrue to the defender—over and over. But it must also use the equally powerful advantages of the attack when the situation is right.

In struggling with this problem we should all be aware that we are in good company. In an earlier article on elasticity in the defense, it was mentioned that Marshal Ferdinand Foch was constitutionally unable to accept the tactics of Marshal Henri P. Petain—tactics which gave ground—but which also brought the last great German offensive to a standstill in 1918.

In 1938, the chief of the German General Staff, Col. Gen. Ludwig Beck, issued new "battle instructions" at the direction of the commander in chief, Gen. Werner von Fritsch. These instructions were interesting in that they reversed the views of the General Staff which favored a "delaying defensive action." It is not surprising that the General Staff, which grew out of the *Reichswehr*—the 100,000-man Army—should have arrived at such a tactic.

The German forces had perfected elasticity in World War I. In the late 1930s they found themselves with 24 incomplete German divisions arrayed against the potential of 90 Allied divisions. But Gen. Fritsch, like Marshal Foch, did not like the tactic. He called it "organized flight." Fritsch and Foch favored the attack.

The "always attack" doctrine worked beautifully against Poland, France and Russia until Stalingrad. Thereafter, the German Army fought a bitter battle with Adolf Hitler, as well as the massive forces of the Russians. Hitler wished to hold every inch of ground. The German generals desperately wanted to fight a maneuvering defense.

In December, 1994, Brig. Gen. Bruce C. Clarke, commanding CCB of 7th Armored Division, held the critical area of St. Vith against the Fifth German Panzer Army under Gen. Hasso von Manteuffel. In the course of that epic battle, one of the most important of all the battles in the Ardennes, Gen. Clarke—in order not to be destroyed—gave ground slowly as he maneuvered his armored force against the Germans.

His corps commander ordered Clarke to give not another inch. Gen. Clarke objected. British Field Marshal Bernard L. Montgomery, commanding all Allied forces on the northern shoulder of the Bulge, sided with Clarke in favor of elasticity.

The classic question now once more confronts an Army faced in Europe with a huge adversary. Diversified tactics, maintaining the initiative, shaping the battle, giving ground when necessary, taking it back by offensive action, leaving the tactical decisions up [to] the officers on the ground—all this is the mark of a cool, mature, well-trained and confident army. Our doctrine should both inspire such an army and express its deep convictions.

But, before ending this discussion, we must turn and face our outside critics who see a failure in our Army to understand the superior value of maneuver.

The maneuver enthusiasts are, of course, entirely right in favoring a war of aggressive movement as the key to success. Aggressive movement is the heart of offensive action, and offensive action is the only route to victory.

Who could disagree with such sound thinking? Where the outside critics err is in their assertion that the U.S. Army does not understand all this.

Part of the problem surely stems from the deep frustration associated with the defensive strategy adopted by the NATO alliance. The decision to defend is the most the NATO commanders believe they can extract from the forces available. These are strategic and operational rather than doctrinal or tactical decisions. The U.S. Army like the other NATO armies is tactically and doctrinally unhappy with the situation in Europe—any professional soldier would be.

But the U.S. Army is not by its character, preference or record of historic performance an attrition-minded, defensive-minded, fighting organization.

The War Between the States, the Spanish-American War, World War I and World War II were characterized by unremitting attack. U.S. forces then were more apt to be labeled bloody-minded than defensive-minded. Static, passive, timid, conservative were, and are, grossly inappropriate descriptions.

The brilliant landing at Inchon, the march to the Yalu and the Ridgway counteroffensive were more typical of the American view of how to fight a war than the political-military stalemate along the 38th Parallel.

Vietnam was a strategic defense characterized almost exclusively by offensive operations within South Vietnam and an offensive air war in North Vietnam. "Search and destroy," a term subject to misunderstanding and opprobrium, is nonetheless no descriptor of a static defense. It was during the war in Vietnam that the strictly American concept of airmobility came into full flower.

The conceptual work by Lt. Gen. Hamilton H. Howze was articulated and practiced by Maj. Gen. Harry W. Kinnard, first in the experimental 11th Air Assault Division and then in combat operations with the 1st Air Cavalry Division.

The tank-minded Israeli Army is coming around to the idea of airmobility and the Soviet Army is in the process of stealing the concept in its entirety. But the seminal work was solely American—not the sign of any hardening of the intellectual arteries or any aversion to maneuver.

Setting NATO aside for the moment, one can make an interesting argument that any other future war will probably be fought under nonlinear circumstances in which offensive action will dominate at the operational and tactical level no matter what the strategic mission may be.

The Middle East presents the clearest possible example of that probability. Given the distance to the Persian Gulf and the relative shortage of strategic lift, it is axiomatic that the forces we could deploy there would be very small relative to the forces we might oppose and would be tiny relative to the vast geographic area in which they would operate. There could be no continuous fronts stretching from the Alps to the sea or across the waist of Korea.

As in the Philippines in 1898, in the Southwest Pacific in 1943, throughout the Vietnam war, small forces conducting offensive operations over large distances would be the order of the day.

The seizure of operating bases and the projection of power from those bases to dominate the surrounding area would be the only real option. Tactical air forces, airmobile and armored forces operating from bases seized and secured by airborne and Marine assault elements will certainly be the heart of our doctrine—very American, bold and imaginative, flexible and aggressive.

The generation of officers now in command, seasoned in airmobile environment of Vietnam, is especially well suited for such operations. Accustomed to open flanks, to operating on the basis of ambiguous intelligence, seeking the enemy and not the terrain, concentrating rapidly, and adapting constantly to the flow of events—these leaders have maneuver in their bones.

Let the critics relax.

5

Tactical Nuclear Warfare

THE EVOLUTION OF U.S. ARMY NUCLEAR DOCTRINE, 1945-1980. By John P. Rose, Westview Press, Boulder, Colo., 1980, 252 pp., $23.50. (Member $21.15)

reviewed by Gen William E. DePuy, USA (Ret)

From his vantage point on the faculty of the Military Academy, Maj (Dr.) John Rose views the evolution of U.S. Army nuclear doctrine with deep dismay. The problem, as he sees it, is succinctly stated in the early pages of his valuable and provocative book:

> Army tactical doctrinal developments—both nuclear and conventional—have been responsive more to political preferences held by national authorities than to the real nature of the threat and the rigors of the nuclear battlefield. Were the two congruent there would be no problem. But the evidence is overwhelming that the type of war preparations favored by United States political authorities over the last decade and a half and the type of war for which the principal enemy is preparing differ markedly. Hence, to the extent that training and doctrine have followed the former instead of the latter, the Army may be poorly prepared for a major war with that opponent.

Although he is focused on "Army" doctrine, the issues he treats go far beyond the Army. By their nature these issues touch upon centerline strategic policy and are thus the legitimate and pressing concerns of all military professionals and defense authorities most certainly including the leaders of the U.S. Marines.

The first and largest part of the book can be characterized as a diagnosis of the problem. Toward the end, the author presents his prescription for a cure. The first part is somewhat stronger than the second.

The diagnostic work is thorough, scholarly, and clear. It takes us through the events and influences which have shaped our tactical nuclear policy and doctrine. Some of these factors have been viewed as constructive, but others—the majority—are described as diversionary and counterproductive.

Rose notes that military institutions have a tendency to resist change and, in the case of nuclear weapons for battlefield use, he considers that resistance to have been stubborn and prolonged.

He is, however, fair in his recognition that there have been powerful diversions which have led the Army away from what he regards as the good works of the 1950s and early 1960s involving a proper attention to the business of tactical nuclear warfare. Maj Rose notes, approvingly, that Army leaders in those days were thinking and working hard on organization and tactics for the nuclear battlefield, and just as enthusiastically endorses the fact that those leaders still held to the honorable concept of winning wars.

But sadly, according to the author, those good beginnings were swept away, first by a concentration on "counterinsurgency" as a policy, and then by its prolonged and doleful application in Southeast Asia.

From *Marine Corps Gazette* 65, no. 4 (April 1981): 64–66.

When Vietnam had run its course, one might have expected a return to the nuclear accents of the late 1950s, but, alas, another diverting event—the Yom Kippur War—seized the attention of the Army. Recognizing that its long preoccupation with a light and elusive enemy in the jungles and paddies of Southeast Asia in no way qualified it for a head-on highly lethal winner-take-all armored battle, the Army concentrated its doctrine and training on the preparation for just such battles.

Maj Rose explains this most recent preoccupation of the Army fairly and exhaustively while regretting its nearly exclusive focus on conventional combat. He does not, as he might well have done, go on to say that NATO rationalization, standardization and interoperability (so-called RSI) had been largely nonnuclear in emphasis. And now the priority afforded to the Rapid Deployment Force (RDF) bids fair to become still another deviation from the nuclear path.

In a country which shuns grand strategic designs, the bureaucracy is often starved for direction and guidance. When counterinsurgency, RSI, or RDF came along as an official policy, they swept all else aside.

The author's perceptions of all this are sharp and penetrating.

In any event the combination of the Yom Kippur War and the NATO priority led the Army to review and revise its fighting doctrine. The results were embodied in a keystone manual, *FM 100-5 Operations,* in which the Army concentrated on fighting outnumbered against superior armored and mechanized forces of the Warsaw Pact in central Europe.

The author points out that not only is *FM 100-5* dominantly focused on conventional weapons, but also that the one chapter on nuclear weapons was added somewhat as an afterthought. He is not inspired with the nuclear doctrine, such as it is, and describes it as merely a procedure for releasing "packages" of nuclear weapons to the tactical commanders. The procedure is so centralized, so time-consuming and arbitrary, that no commander can plan with any assurance a tactical scheme of fire and maneuver.

This reluctance to unleash the nuclear weapon, even at the tactical level, and the awkwardness of the resultant control mechanism leads the author to the heart of his concern—the attitudes of many senior military and most senior civilian policymakers toward the employment of nuclear weapons.

Rose sees several converging forces at work. The first he describes as a congerie of myths and illusions—of false images surrounding nuclear weapons. Coupled with the first, indeed fostering these myths, is a general ignorance of the facts regarding the characteristics and effects of modern nuclear weapons. Third, is the resulting absence of any coherent tactical nuclear strategy, realistically tied to a plan of campaign.

These forces, which have been at work for at least 15 years, have created a whole theology of reticence—a blind trust in deterrence and the abhorrence of a fullblooded search for the tactical utility of nuclear weapons. The theology may be recognized by its reactive language—flexibility, war avoidance, graduated response, conflict termination. It is not a war-fighting doctrine. It is, rather, a desperate hope that deterrence will work, that if somehow such a war should ensue it can be held at a low level of violence, and finally that "war termination" can be induced by metering out the horror in limited packages of violence with no other military objective.

War is looked upon as a natural calamity such as Mount St. Helens. It calls for a damage-limiting approach not—perish the thought—a war-winning mentality. This policy chooses to overlook all the giant issues, grievances, and perceived threats which led to the outbreak of war in the first place. They are dissolved in the mutual aims of both parties to stop the fighting. Everything we know about the Russians makes this a policy of madness.

This nation, of all nations, should have learned in Vietnam that our enemies fight for a purpose. Metering violence may appeal to us as a rational concept, but it seems only to enrage our adversaries.

The author explains the evolution of nuclear weapons toward battlefield utility by limiting one or another of their lethal effects. The neutron bomb (enhanced radiation) is optimized against personnel while the limited radiation weapon is designed to reduce fortifications. His attack on the myths and illusions is well conceived and skillfully conducted. However, regrettably, Rose looks only at one side of the equation. Are the Russians as fastidious as we seem to be in respect to collateral damage? Do they see virtue in battlefield restraint or are they inclined always to raise the ante in search of victory?

The author must believe the Russians see, as he does, a kind of tactical nuclear firebreak between conventional operations on the one hand and strategic nuclear war on the other.

Perhaps. But the definition of strategic nuclear war to a European may not coincide with ours and the Russians stand deep in Europe. Additionally our European allies are just as frightened of theater nuclear war as we are of strategic war. Unfortunately, the fact that tactical nuclear weapons of advanced design may be no more destructive than conventional weapons used in mass does not, by itself, remove these widespread concerns.

But Rose would probably say that these complications in no way change the fact that we may find ourselves in nuclear combat for which we are not prepared.

For their part, the Soviet authorities give every indication that they are fully prepared to resort to nuclear weapons as a key element in their tactical and operational plans for victory in Europe. Grechko says that Russians say what they mean and mean what they say. What they say is that nuclear weapons will provide the firepower to support the offensive operations on which they depend for victory. Some now take comfort from the fact Russians admit the possibility of a conventional phase of operations—that they have been greatly increasing their conventional firepower—and that they have said much less about nuclear war since 1971. But the greater fact is that they have the capability to fight a tactical nuclear war now and we, according to Rose, do not.

He suggests the time has come to face this issue, to cast aside the illusion and embrace the realities, one of which is that "sub-kiloton weapons with increased accuracy offer a credible tactical weapon as warfighting instruments." On this basis and other realities he sets forth his own concept for a nuclear war fighting doctrine.

The first premise is that nuclear weapons can be folded into tactical operations without undue difficulty.

> In spite of different effects generated by nuclear weapons, tactical battlefield operations are not obsolete to the art of war. Provided certain practical adjustments are made to counteract nuclear effects, nuclear weapons have not compounded the complexities of warfare.

From that point the concept is simply that sufficient nuclear weapons will be released to the tactical commanders so that they may get on with the war. Planning and coordination should be centralized (at corps and division) but control and execution of nuclear fires must be decentralized (to battalion level).

So far so good. The idea of operating the maneuver force at the battalion level is classic and largely unarguable. Giving those battalion commanders support by nuclear weapons would certainly be required, but it is simply not credible that this combination alone would defeat the Warsaw Pact. The author touches but lightly on other applications:

> The proposed concept allows for immediate nuclear engagement of targets . . . . to include: enemy nuclear capability maneuver units, second echelon units, fixed targets . . . .

Nonetheless, it is here that the main chance for success surely lies.

Except for fixed targets, the practical application of nuclear weapons has been restricted primarily to those targets formed by the configuration of the front and the shaping of the battlefield by maneuver. This is the realm in which the battalions operate.

But the bulk of the enemy force during the critical early days of war is not visible from frontline battalions nor is it fixed in nature. Rather, it is on the move from and through the rear areas. Just recently has high technology produced the means to find and strike these moving or movable targets. The wizards of micronics are now producing sensors of all kinds—radars, electro-optics, thermal, electronic, electromagnetic—which can detect enemy forces in the deep or proximate rear areas. High volume processors can correlate or fuse this information into both target and situation analyses. Precision weapons can be launched within time and accuracy tolerances suitable for the engagement of these moving or movable targets.

The destruction or decimation of the enemy elements moving to contact must surely be the most effective application of tactical nuclear weapons. If this can be done the battalions in contact could maneuver to victory over the first echelon enemy in the main battle zone. The "good old American pragmatism" which Rose admires and finds inherent in American fighting men could be given free rein.

But without chopping the Warsaw Pact down to size, even the Sgt Yorks and Gen MacArthurs would have their hands more than full.

Something along these lines must be the basis for a tactical nuclear war fighting doctrine. There is, however, no guarantee that the Russians aren't equally aware and at the moment better prepared.

The issue of who strikes first lies untouched in the Rose treatise. Suffice it to say that only an intact, coherent force could possibly execute the nuclear interdiction of an enemy's second echelon and only such a force could maneuver successfully on a tactical nuclear battlefield. It seems unlikely that any force subjected to an extensive first strike with theater nuclear weapons could do either. Regrettably, Maj Rose stops short of these issues.

6

TOWARD A BALANCED DOCTRINE

By Gen. William E. DePuy
U.S. Army, retired

The seductiveness of maneuver doctrine tends to magnify its virtues and to understate the importance of synchronization, without which the most ingenious maneuver schemes can degenerate into indecisive minuets or end in disaster.

Gen. George S. Patton Jr. would be pleased to know that maneuver doctrine has taken a strong hold on the U.S. Army of the 1980s. It has a long list of virtuous features. At the risk of oversimplifying, here are some of the most important:

- Maneuver doctrine brilliantly provides the basis for exploitation of the high mobility provided by the M1, M2, M3 family of armored fighting vehicles and the two modern helicopters, Blackhawk and Apache.
- Maneuver doctrine is active as opposed to reactive and thus fits, more comfortably, the American temperament.
- Maneuver doctrine seeks to keep the opposing force forever off balance, forever reacting to U.S. initiatives but always one futile step behind. It is assumed (hoped?) that the Soviet operational and tactical system is cumbersome and thus a natural victim for such a doctrine.
- Maneuver doctrine as expressed in *FM 100-5* is a sound, logical step forward on the long road of tactical evolution. It has ample growth potential to absorb new technology.

On the other hand:

- As touted by certain members of the military reform movement it could be construed as a one-dimensional answer to multidimensional problems on the battlefield.
- The explanation of AirLand Battle 2000 usually has reinforced the notion that bold maneuver alone will carry the day.
- The Army and the Air Force are not yet fully together on the coordination of battlefield air interdiction (BAI) against rapidly moving enemy follow-on forces—a central theme of AirLand Battle.

Partly because maneuver doctrine is so inherently attractive to soldiers, it has generated its own excesses. In arguing its undoubted merits, proponents have apparently felt it necessary to contrast those virtues with the vices of alternative doctrine. The chief contrast has been drawn with the so-called tactics of attrition.

Attrition is such an "ugly" doctrine that it claims no known or announced adherents, even though most wars finally have been resolved on that basis. Certainly it is permissible to be against

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attrition so long as the critic does not spread his anathema over the whole idea of fighting; not only fighting, but hard, bloody fighting, should that be necessary.

Victory in such combat has classically gone to the commander who concentrates (and applies) superior combat power at the point and time of decision. We know, but sometimes forget, that there are *two* dimensions to concentration and *two* methods involved:

- Concentration of forces in space via maneuver.
- Concentration of actions in time via synchronization.

This article's premise is that proper doctrine must seek both goals and employ both methods in a judicious mix and that synchronization embraces a widening range of complex but essential functions.

Lest this issue seem overdrawn, there are a number of very bright and influential young field grade officers who have contributed much to maneuver doctrine, who by their talent will remain influential in doctrinal matters throughout their careers and who are genuinely worried about what they perceive as a mutually exclusive relationship between maneuver and synchronization. The argument goes that synchronization smacks of set-piece warfare—a Montgomery perhaps, compared with a Rommel or a Patton. And if synchronization, therefore, means stopping the war for time-consuming, deliberate arrangements for every battle, then it will nullify the enormous benefits that otherwise would flow from rapid and bold maneuver.

This is not a trivial issue. Perhaps the logic trap is in moving the discussion to the outer boundaries of each concept. One could visualize an army strangled and immobilized by its internal procedures for synchronization, every battle a Normandy landing or an El Alamein. Correspondingly, an army devoted to an endless bloodless ballet does not inspire much confidence.

But extremes prove very little. Common sense tells us to move toward the center, to synthesize the virtues of each in a higher order of competence and professionalism—an Hegelian dialectic if you will. The remainder of this article, therefore, centers on synchronization with the goal of bringing that process up to a level of equal prominence with maneuver in doctrinal thinking throughout the Army.

This is not an argument against maneuver doctrine. It accepts the primacy of maneuver as all supporting actions must be keyed to maneuver. The scheme of maneuver (concept of operation) is the first and great requirement. The second, which is like unto it, is synchronization.

The history of war is replete with examples in which superior forces were concentrated for battles which were then lost to smaller but better-handled opponents.

Gen. Sir Bernard L. Montgomery's predecessors in North Africa, with the notable exception of the unsung Gen. Sir Richard N. O'Connor, regularly assembled forces larger and potentially stronger than the Germans, and just as regularly were defeated. At Gazala, Field Marshal Erwin Rommel maneuvered himself into the rear of the British and into what the Germans themselves described as the witches cauldron. With the British commander, Gen. Sir Neil M. Ritchie in the rear, the Eighth Army never made a concerted and decisive move against the trapped *Panzer* Army. Individual British (Indian and New Zealand) brigades engaged the Germans as the spirit seized their various commanders or as they were forced to fight for survival. But Gen. Ritchie probably never generated, at any one time, more than ten to 20 percent of his army's latent power.

Gen. Rommel, on the other hand, was actively present in the "cauldron" with his troops. He, personally, brought up his supply and ammunition trains, had a path cut back through the British mine field as a direct resupply route, issued orders to his force, routed the Eighth Army and went

on to the Egyptian border—capturing Tobruk on the way. He synchronized the actions of his smaller force and developed more intensive combat power at the critical time.

It is interesting to note that the deep enveloping maneuver of the Germans did not stampede the phlegmatic British. The mere presence of the whole *Panzer* Army in the British rear was not enough. Only when Gen. Rommel delivered a well-coordinated attack did the defense collapse. The psychological effects of maneuver can be overstated. British phlegm may have its counterpart in a Soviet command which is less than skittish.

Finally, on this point, the French have a marvelously descriptive term for the tactics of a force so powerful and confident that it ignored the movements of the enemy and simply marched straight to its objective—"a maneuver of scorn."

Until recently, the thought behind the word "synchronization" was embodied in two well-worn tactical and organizational concepts: "fire and movement" at the lower tactical echelons and the "combined arms team" on the organizational plane. The regimental combat team (RCT) of World War II was composed of infantry, artillery, engineers, antiaircraft automatic weapons, tanks and tank destroyers attached, plus medics and services so that the commander had in hand all the ingredients necessary for a successful battle.

The modern brigade is built on the same concept as indeed is the division. The term used in World War II, and even now, to convey the idea of synchronization was "coordination" as in a "coordinated attack." The term "synchronization" has been brought forward to imply a greater scope and more precision in the relationships between the functions and activities performed on the battlefield.

First the scope: the branches of the Army plus the tactical air force define most but not all of the functions involved. It is interesting to note that a branch is usually formed as soon as the battlefield function is acknowledged as vital and unique. A recent branch to be formed was intelligence. Electronic warfare (EW) teeters on the edge of qualification. Army aviation has been formalized as a branch.

Departing for a moment from the classic view of corps, divisions, brigades and such, the Army actually consists of *parallel, echeloned, vertically integrated* and *individually controlled* functional systems. For the purposes of execution they are echeloned vertically. For the purposes of synchronization, they are sliced horizontally at the level of each major tactical and operational echelon. Because maneuver is the key to which all functions relate, those horizontal slices are the familiar armies, corps, divisions, brigades, battalions, companies and elements of the maneuver force. These relationships can be depicted graphically. (See the diagram on page 317.)

The tactical air control system has been added to the diagram in parentheses, added because tactical air is a key function, in parentheses because of Air Force sensitivity. There are several things to be said about this simple diagram:

- The maneuver function is the first among equals because all other functions are keyed to the scheme of maneuver, but it is important to understand that the maneuver arms are a small fraction of the strength and composition of the army in the field.
- All the vertical functions are multi-echeloned. Some, like intelligence, extend all the way from the surveillance radar platoon or the intelligence officer of the infantry battalion up through the echelons all the way to Ft. Meade, Md. Fire support extends from the forward observer (FO) with the maneuver unit through the battery and up to the corps artillery. Air defense extends upward from the "Stinger" to the theater air force commander.

- These vertical functions are true systems—input (FO), process (fire direction center/Tacfire) and output (a volley by 155-mm howitzers). They are vertically integrated systems, often with their own internal communications (the netted radars of air defense).
- A tactical commander, say brigade, owns and operates just small segments of the vertical systems and thus is dependent on all those links in the chain above his level. If those links are severed, for example by distance, enemy action or communications failure, the effectiveness of the functional system is greatly reduced. The intelligence system, for example, is totally dependent on continuous vertical linkage. A large part of the intelligence which a brigade commander will need to maneuver wisely will come to him *down* the chain from above. So, too, air-defense alerting as well as interdiction and counterfire targeting will come from above.
- The *execution* of plans and orders amounts, finally, to a specific action at the lowest echelon of each function; for example, the tank moves, the howitzer fires, the air-defense missile is launched, a bomb is dropped, a bridge is built, information is acquired, a radio is jammed, a part is delivered, an engine fixed.

It is the horizontal synchronization of these actions, which concentrates combat power in controlled bursts of intensity that wins battles—battles to which these elements have been conveyed by maneuver. Synchronization is the responsibility of the maneuver commander.

Army doctrine has long recognized that synchronization is a stepped function. The degree of synchronization will vary depending on the tactical circumstances. Consider the classics:

- A meeting engagement.
- A hasty attack (or defense).
- A deliberate attack (or defense).

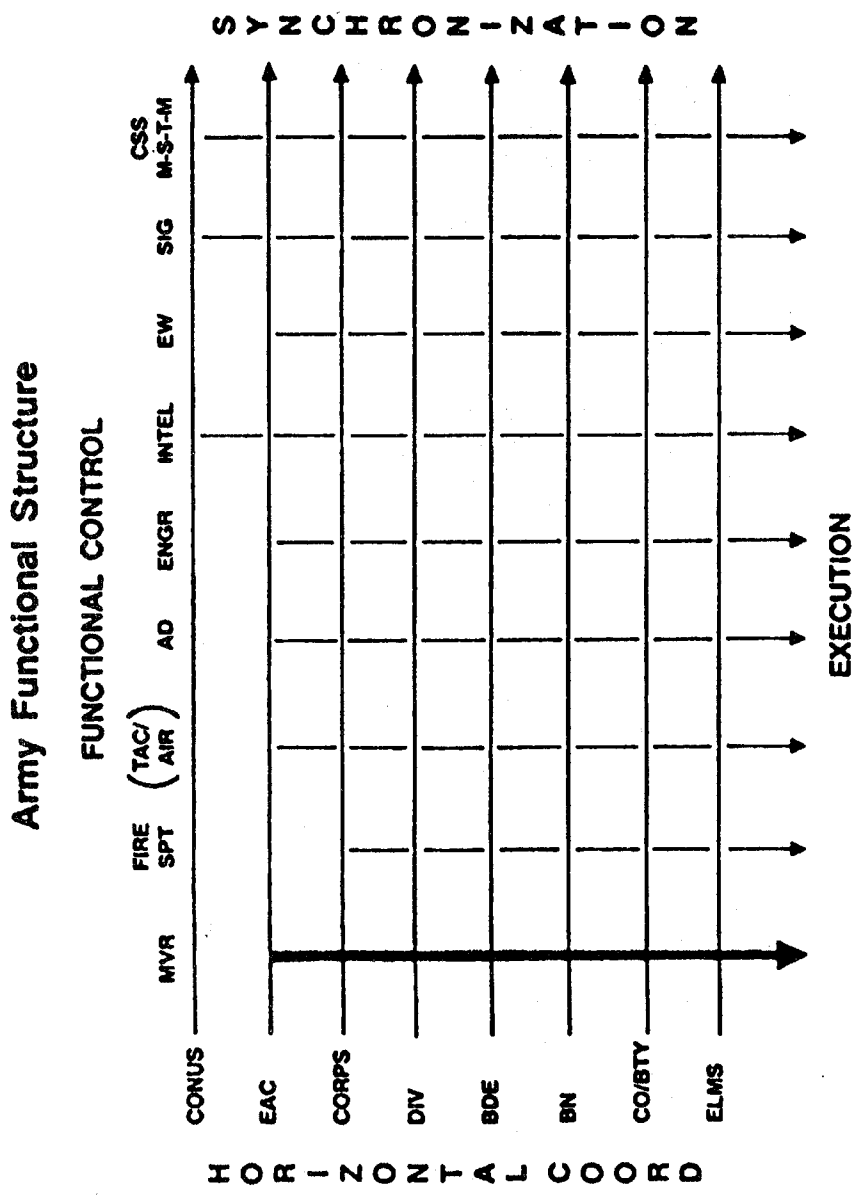
Obviously, meeting engagements consist of many unforeseeable happenings to which commanders must respond as they occur. Beyond basic fire and maneuver, the degree of synchronization is relatively low because time is short. In the hasty attack and then in the deliberate attack there is progressively more time and thus more synchronization.

The question arises as to just how one decides how much synchronization is desired or required. This question carries us to the heart of the military art.

Only the commander can decide (and he must decide). Commanders vary. Gen. Montgomery had a passion for full synchronization that involved *very* deliberate preparation. Gen. Patton was the opposite. While Gen. Montgomery prepared a world-class extravaganza for his Rhine crossing, Gen. Patton slipped the 5th Division across at Oppenheim without breaking the stride of his general advance. In neither case was there much opposition. The German Army was already beaten and Gen. Patton's judgment was the better.

How *does* the commander decide? Time is a double-edged sword. While we are preparing our attack, the enemy can be preparing his defense. So there is a fine judgment required and there is a high premium on speed and efficiency of the synchronization process. We are, of course, involved in a search for relative advantage. Synchronization is a method of maximizing that relative advantage—it is a synergistic process. If an immediate charge into a disorganized enemy produces the greatest relative advantage, then that is the right solution. But an impetuous attack into a deliberate defense is the wrong solution. In between, there are many choices.

In addition to the degrees of synchronization there are other variables, such as echelons involved and the precision required. At the lowest echelons where synchronization is fire and movement, precision is everything. If the first platoon charges into the open before the second


Army Functional Structure
FUNCTIONAL CONTROL
MVR
FIRE SPT
(TAC/AIR)
AD
ENGR
INTEL
EW
SIG
CSS M-S-T-M
CONUS
EAC
CORPS
DIV
BDE
BN
CO/BTY
ELMS
HORIZONTAL COORD
SYNCHRONIZATION
EXECUTION

platoon opens its overwatching suppressive fire, it is a disaster. We are dealing in seconds. This level of precision extends through company to battalion.

At brigade the tolerances are slightly relaxed, but only slightly. Even at division the counterfire and EW must occur within minutes and fractions of minutes to reinforce the combined effects. So one might say that high precision synchronization is a characteristic of the tactical echelons (battalion, brigade and division).

But synchronization, perhaps with slightly relaxed tolerances, must extend also to the operational echelons—particularly the corps. For a number of years, the Army and Air Force have been working (at Tactical Air Command, Training and Doctrine Command, and Readiness Command, for example) to develop the mechanisms and procedures for air-land cooperation at the corps level. Recently, Lt. Gen. John R. Galvin, commander of VII Corps, wrote about the high potential for progress in the U.S. Air Forces in Europe/U.S. Army, Europe, joint enterprise called the "Warrior Preparation Center." This effort to train commanders and staffs in airland battle operations also affords a basis for refining cross-service procedures and concepts of operation.

Gen. Galvin notes that some of those procedures have become more mechanical than tactical. At least one reason for that state of affairs could be that the Air Force has not yet decided exactly what to do about battlefield air interdiction. By definition BAI involves the launching of attack aircraft against targets of high significance to the ground commanders. But, because the destruction of these targets requires the penetration of enemy air defenses, the Air Force wishes to go about such operations in a deliberate manner involving careful planning and the employment of a number of support aircraft—the Air Force version of synchronization.

These are not insignificant problems and push the Air Force toward a 24-hour planning cycle—an intricate and extended process. The Air Force would thus prefer to handle BAI in the same manner as any air interdiction mission, the only distinction being the target selection process.

The unresolved problem arises when the army requests the attack of moving enemy targets (for example, a tank division approaching on route A). The nature of these targets, the importance of them to the army commanders and the response times required make the synchronized attack of these targets by Tactical Air Command air entirely incompatible with 24-hour planning cycles. The Air Force clearly is agonizing over this problem. It is unresolved. We can hope that such joint efforts as the Warrior Preparation Center will contribute to a solution—Gen. Galvin seems to believe they will.

It has long been clear that an absolute prerequisite for the effective employment of a force is a clear, simple commander's concept of operation. Based on this concept, which features his "scheme of maneuver," all the functional commanders can plan and execute their part of the battle.

The commander's staff will further elaborate and schedule (synchronize) the actions in time and place.

In the event of surprises, errors and other inevitable misfortunes such as communications failures, each subordinate can act as he believes the force commander would act were he present. The subordinate can act through his understanding of the larger concept. Without such knowledge he must wait for orders. This, of course, is the essence of the German *Auftrag Taktik* (that is, based on mission-type orders)—continuous, intelligent and adaptive synchronization.

There is more to synchronization than *Auftrag*. Let us imagine that the reader has been appointed suddenly as a task force commander (division- or corps-sized expeditionary force, say

to the Middle East). As he surveys his new command and considers the great distances over which he must operate he would discover that the vertical systems were all stretched to, or beyond, their elastic limits in terms of communications. In short, some of the links would separate.

To the extent that the vertical systems are pulled apart by distance, to that same extent, does he lose his intelligence support—his air defenses—his fire support and logistics, and the like. He has no basis for synchronization even if he is able by personal effort to get instructions down to his battalions and brigades. His smaller force is then reduced to the guns and bayonets of the maneuver battalions.

This is the great challenge to the designers of contingency forces. It is the essence of C^3I (command control communications and intelligence) design. The suddenly appointed commander who does not understand this and does not take expedient measures to repair his ignition harness is headed for disaster.

Recently there have been disturbing claims that the Soviets have set higher standards for synchronization than has the U.S. Army. Suffice it to say that they seek to execute an operation at army level (a big U.S. corps) five to six hours after receipt of orders. Even if it takes them twice as long, say 12 hours, they would not be the slow, sluggish organization we happily describe to ourselves. If we intend to operate inside his decision cycle we have our work cut out for us. Fast synchronization comes from good, simple procedures backed by reliable communications.

Perfect synchronization shuts down the enemy force. At the lowest level—that of fire and movement—the fire suppresses the defender and the attacker moves in with grenades and automatic weapons. There are very few perfect operations even at the lowest echelons (there are some). As the scope of synchronization expands there will be no perfect operations. But perfection is the design goal. A perfect operation might have the following features:

- Near-real-time surveillance reports, reinforced by supportive intelligence, of sufficient accuracy so that the commander knows the major dispositions and movements of the enemy and has time to announce his concept of operations and issue necessary orders.
- Just when the Red artillery could be expected to suppress our antitank defenses, his guns are silenced with counterfire.
- Just as the Red attack is stopped in front of our defensive position and just when the Red commander wishes to issue new orders, his command net is shut down by surgical jamming; his efforts to turn his force to meet our counterattack are futile—his tanks are faced in the wrong direction.
- As Red attack helicopters appear to support his attack, they are driven off by carefully positioned air-defense weapons.
- As our counterattack moves into the flank of the enemy force stalled in front of our defensive position, the Red overwatching forces will be blinded by smoke and rendered ineffective by the fires of our artillery and by our close air support.
- As Blue attack aircraft go after the follow-on forces to keep them out of the current battle, Army rockets suppress Red air-defense weapons along the ingress route and no aircraft are lost.

Because synchronization is a reciprocal game, every success enjoyed by Blue is a subtraction from the effectiveness of Red. Remember, we are only interested in subtracting from the Red force those elements of effectiveness which interfere with the successful fulfillment of the Blue concept of operations. This leads to lopsided victories by the force in synchronization.

Instead of the narrow range of force ratios with which combat models normally deal (in the range of 3, 4, 5, or 6 to 1), we see actual relative combat power ratios and resulting loss exchange

ratios of 10, 20, 30 or 40 to 1. Unfortunately, what we cannot measure we do not cherish. With rare exceptions, the force-on-force combat models now in use do not adequately reflect the high payoff of synchronization.

At this point, we must make an excursion to slay a pesky dragon.

When the "assault breaker" program was launched by the Office of the Secretary of Defense/Defense Advanced Research Projects Agency, its very name conveyed extravagant hopes. Via assault breaker, we would find and destroy the Warsaw Pact armored forces long before they appeared in the main battle area. It was simply a matter of buying the radars to find them, the missiles to reach them, and the smart munitions to kill them. Over time, and on reflection, wiser heads prevailed and these expectations were scaled down.

The airborne radars would be vulnerable to air and surface-to-air missile attacks, and in the choppy European terrain there were limits to line of sight. The effectiveness of smart warheads was greatly reduced against targets in forests or against long linear targets, like columns on roads. Some of the munitions had not yet demonstrated cost-effectiveness. And most important, the overall cost of the system began to escalate to the point where the services decided that the program would absorb too large a fraction of their budgets relative to the effects they expected to achieve.

Almost from the beginning, top Army managers judged that such wholesale bashing of the Soviet armor at long ranges was a dubious enterprise. However, the Army saw value in "deep attack" as a means of creating discontinuities in the arrival rate of follow-on forces (second echelon) which would offer opportunities for offensive maneuver. A bridge was thus extended toward AirLand Battle doctrine. But this conceptual bridge has never been completely built.

In the early days of assault breaker—which had become known doctrinally as attack of the second echelon or in the North Atlantic Treaty Organization (NATO) as follow-on forces attack (FOFA)—various analyses were undertaken to determine the relative value of different targets in the enemy rear area. The target values were related to the importance of each to the Red commander. Herein lies a problem which persists to this day. Red-based target value analysis (TVA) is a wholesale approach to a problem for which wholesale means will never be available.

A single corps could shoot up 1,000 two million dollar missiles (two billion dollars) in a short period of time if it were expected to participate in wholesale armor bashing. No responsible Army leader believes that this kind of money will be forthcoming while at the same time it is used to buy an otherwise modernized and balanced fighting force.

In order to exploit the new deep attack technology, within reasonable prospects for funding, the Army is looking at more modest application—such as deep attack synchronous with maneuver, not just generally harmonized as in corps campaign plans, but intimately synchronized as in support of a brigade or division scheme of maneuver—not attacking all Warsaw Pact elements detected and in range but that particular regiment or tank division which must be held off while the U.S. commander executes his surgical operation against the first echelon. It is obvious from this redirection that TVA must be based directly on value to the Blue commander; in short, values derived from their impact on the ability of the Blue commander to execute his concept of operation.

Limitations on means are not restricted to long-range missiles. The U.S. Army will never have enough EW equipment to jam all the Russian radios in range, only enough to jam the critical radios in a selected area at the proper time. Correspondingly, there will never be enough multiple-launch rocket system rockets to shut down all the Soviet artillery detected and in range—only selected artillery at exactly the right time.

Commanders in the field instinctively line up on the side of Blue target value, although they may not think of it in those terms. After all, they command combined arms formations to which they must issue instructions based on what *they* plan to do.

Unfortunately, most of the analytic and modeling community is still Red TVA oriented. Not the least reason is that their modeling techniques are not sensitive to the Blue-oriented (synchronized) operational doctrine. They can, however, easily handle the implications of a generally diminished Red force—diminished by wholesale bashing but never enough. So without means to measure the value of synchronization, they tend to ignore the premise. The immediate danger that arises out of this basic conceptual error is that deep attack prices itself out of the market on a wholesale basis whereas it is affordable and vitally important on the retail plan—that is, in synchronization with maneuver.

To close this argument, the following excerpts are taken from the revealing book *The Desert Generals* by Correlli Barnett (Indiana University Press):

> In the words of a German staff officer: "A German panzer division was a highly flexible formation of all arms, which always relied on artillery in attack or defense. In contrast, the British regarded the anti-tank gun as a defensive weapon, and they failed to make adequate use of their powerful field artillery, which should have been taught to eliminate our [the German] anti-tank guns."

Gen. William H. E. Gott, commanding general, 7th Armoured Division, British Army, said:

> The German will not commit himself to tank versus tank battle as such. In every phase of battle he coordinates the action of his anti-tank guns, field artillery and infantry with his tanks and he will not be drawn from this policy.

Gen. Michael O'Moore Creagh, 7th Armoured Division, British Army, in a lecture on Battleaxe said: "When on the defensive his [the German] policy was to draw our tanks on to his guns and then to counterattack with tanks."

> . . . the green territorial troops of 22nd Armoured Brigade, only a month in Egypt, had charged home on the dug-in Italians as if on a fox, and had been beaten off with the loss of 52 tanks.
>
> During the engagement [Crusader] . . . the British phalanxes of tanks had tried to get at the German armour, ensconced amid its lorried infantry and artillery, in a series of cavalry charges . . . They had been shot to a standstill by the German anti-tank artillery . . .

These passages tell us that maneuver, in the offense or defense, in the absence of the carefully synchronized actions of all the elements of combat power did not work well on the North African desert in 1941-42 and that it could not be different today.

7

A World War II Story Retold from New Perspective

A Time for Trumpets: The Untold Story of the Battle of the Bulge. Charles B. MacDonald. William Morrow & Co., Inc., 105 Madison Ave., New York, N.Y. 10016. 712 pages; photographs; charts; notes; bibliography; $19.95.

By Gen. William E. DePuy
U.S. Army, retired

A master historian, marvelous storyteller and participant, Charles B. MacDonald, has written a story of an epic battle from the unusual perspective of the soldiers who fought it. The author says it is the untold story of the Battle of the Bulge, and he is right. His book will be cherished by the men who did the fighting, celebrated by enlightened historians and studied by professional soldiers.

The men who fought and survived that bitter campaign will appreciate this book because the author tells their story—the story they wanted to tell but could not. Each of them saw just a tiny fraction of that rending collision between two enormous armies.

Like all huge battles, this one involved thousands of engagements between small groups of men contesting for dark wood lines, tiny villages and temporarily important crossroads.

For these soldiers, on both sides, Mr. MacDonald has added deeper meaning to their personal experiences; meaning beyond the bitter cold, numbing fear and desperate comradeship.

For this purpose, the author has sketched in the top-down context. For those soldiers, he has put the pieces together. But, overwhelmingly, his is a tribute to the very soldiers he takes the time to describe.

Never mind that Army groups, armies, corps and divisions were working their way competently through a whole new operational experience. The author's message is that individuals made a difference. Some rose to the occasion while others faltered or failed, but an astounding majority did what was necessary. Courageous men appeared, did their duty, sometimes survived, often did not.

The author names and describes many such men and their actions. Notwithstanding his heroic effort to give credit where credit is due, there were many more of equal merit known only to God and their buddies. For these, too, this splendid book was written.

A Time for Trumpets is also a much-needed historical corrective. Understandably, the circumstances of that campaign elevated a few units and their dramatic battles to prominence and thereby assigned obscurity to most of the others. Mr. MacDonald raises the visibility of scores of other actions of comparable importance without diminishing the luster of the battles at Bastogne and St.-Vith, Belgium, and the Third Army's agile and aggressive move against the south flank of the German salient.

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Now, instead of three great peaks rising from the plain below, Mr. MacDonald has described a towering massif—a cluster of peaks rising from a high plateau of exemplary performance, courage and sacrifice by the vast majority of units and individuals involved.

Although the Battle of the Bulge extended from 16 December to 28 January, when the entire salient was finally erased (a period of 43 days), this book is largely confined to the first 11 days. It would have been impossible to continue the depth and intensity of his treatment much longer in a single book. Out of 623 pages, the first four days of battle consume over half. By Page 584, he reaches the end of the 11th day of battle. Of course, much bitter fighting took place over the last 32 days. Half the 80,000 American casualties occurred after 3 January.

How then can this book be called an historical account of the Battle of the Bulge? The answer is that, strictly speaking, it cannot. But the author is right in his appraisal that by the day after Christmas, 1944, the 11th day of battle, the German attack was broken. The issue was no longer in doubt. The crisis was over.

Adolf Hitler was not prepared to accept failure or admit to his forces that his gamble had failed. His brave soldiers fought on in the great tradition of the German Army and both suffered and inflicted grievous additional losses.

Hitler had a grand, if unrealistic, goal. He wanted his newly reconstituted *panzer* armies to slice through the Ardennes, as they had in 1940, and instead of heading for the channel coast at Dunkerque, France, to turn more abruptly north to Liège and on to Antwerp, Belgium.

This would isolate, and pin against the North Sea, four armies—over half the entire Allied force. His generals thought his plan was too ambitious, given the forces available, but thought they might reach Liège and destroy the U.S. force south of the Meuse River.

Although one of the two *panzer* armies did break through in the southern zone and nearly reached the Meuse at Dinant, Belguim, the Sixth *SS Panzer Armee* on the north was stymied from the outset by the unexpectedly stiff resistance it met in the vicinity of Elsenborn, Belgium, and to the north. Moreover, every effort by the German force to turn toward Liège was blocked by the successive and successful extension of the First U.S. Army front to the west.

The margin of affordable error during this first week and a half was near zero. The issue was continuously in doubt.

The gallant defense by the divisions on the frontier (4th, 28th, 106th, 99th and 2nd Infantry divisions and the 9th Armored Division) plus corps and Army combat engineers bought some precious reaction time for the badly surprised American high command. The description of these battles forms the strong introduction to Mr. MacDonald's account. That reaction time was well spent.

After the initial shock on 16 December, the command responded quickly. Four reinforcing divisions (7th and 10th Armored divisions, an 1st and 30th Infantry divisions) were on the move by 17 December, and the two airborne divisions (82nd and 101st) were on the way the next day.

Each of these divisions arrived just in the nick of time, and the gripping story of the battles along the frontier on the northern flank and around Bastogne form the spine of Charles MacDonald's detailed account.

By the 11th day of battle:

- The northern shoulder at Elsenborn had been stabilized after bitter fighting by the 2nd, 1st and 99th divisions. If one looks for a center piece, this is it.
- Sixth *SS Panzer Armee* was never able to get its attack rolling to the northwest. *SS* Lt. Col. Joachim Peiper's *kampfgruppe* had been destroyed.

- Bastogne had been defended by the 101st Airborne and elements of 9th and 10th Armored divisions. The road from the south had been opened by the attack of 4th Armored Division of Third Army.
- First Army had extended a strong defense westward from Elsenborn by the successive deployment of a veteran and formidable force consisting of 30th Infantry, 82nd Airborne, 3rd Armored, 84th Infantry and 2nd Armored divisions grouped under XVIII Airborne and VII corps.
- The last effort by the Germans to break through to the Meuse River and Liège had been defeated by the offensive action of 2nd Armored Division of VII Corps at Celles, Belgium.
- With the 26th Infantry, 80th Infantry, 10th Armored (-) and 5th Infantry divisions, Third Army had driven the southern blocking force (7th German Army) as far north as the Sure River east of Bastogne.
- German commanders on the ground knew that the attack had failed and went over to the defense.

"The Road Back"—the collapse of the salient, the hard fighting involved, the commitment of nine more American divisions—is included by the author for completeness, but his heart is not in it and his method will not permit it. He has told the story he set out to tell.

Professional soldiers will study this book long and hard. It describes in clinical detail what happened when the U.S. Army was struck without warning by a massive armored attack—a one-time experience in its long history.

Mr. MacDonald's book arrives when U.S. Army doctrine for such a contingency is in healthy ferment. The timing could not have been more opportune.

The similarities between the situation facing NATO commanders today and those that faced VIII Corps, First Army and 12th Army Group in 1944 are extensive. The Fifth *Panzer Armee* with five divisions attacked two U.S. divisions deployed on a 40-mile front. Today, U.S. V Corps in Germany covers a 50-mile front with two divisions and is opposed by a Soviet army of five divisions. *Kampfgruppe* Peiper was the forerunner of the much-discussed Soviet operations maneuver groups.

It might be more than interesting to bounce emerging Army tactical and operational concepts against the scenario which unfolded 40 years ago and has just now come alive thanks to Mr. MacDonald's pen.

8

The Light Infantry: Indispensable Element of a Balanced Force

By Gen. William E. DePuy
U.S. Army, retired

Unequalled in its preferred terrain, this versatile addition to the modern U.S. Army has the ability to fight effectively in a wide variety of situations. But to achieve their maximum potential against an enemy equipped with modern armor, our light forces badly need an adequate shoulder-fired antitank capability.

A 50-year trend toward larger and heavier divisions was stopped by Gen. Edward C. Meyer and reversed by Gen. John A. Wickham Jr. when these Army chiefs of staff, one former and the other incumbent, gave a new dimension to Army capabilities by making room for the light infantry division.

Reactions to this turnabout have been mixed. There is a satisfaction with the increased strategic mobility of the new light infantry divisions, but concern about their utility once delivered.

Others wonder how this new departure measures up against continued Soviet emphasis on heavy armor and how it fits the Army's new tactical doctrine and strong focus on maneuver.

It is my premise that light infantry is required and that the chief of staff is correct in his move to meet that requirement now.

Few have difficulty in sensing the utility of light infantry in, say, Central America or even Korea. When applied to Europe or Southwest Asia, however, there is conceptual difficulty and considerable confusion.

History and recent experience tell us that armies must be able to fight in all kinds of terrain against all manner of opposing forces. The heavy armored and mechanized divisions which have come to dominate the U.S. Army force structure are designed to confront similar formations of the Warsaw Pact on the central NATO front.

More specifically, they are designed to execute highly mobile operations in the remaining open areas of West Germany. These heavy divisions are less suitable, however, for operations in forested areas and increasingly urbanized terrain. They are, of course, unsuitable for operations in mountains.

Light infantry, on the other hand, is highly suitable for operations in these kinds of closed or obstructive terrain and in such an environment is more mobile, survivable and effective than armored or mechanized forces.

From *Army* 35, no. 6 (June 1985): 26–41.

Because this assertion regarding the relative effectiveness of light infantry will not go down easily in some quarters, I shall dwell on the matter at some length.

The light infantry: What is it? What can it do? How does it differ from the Army's other maneuver arms?

At the outset, it must be made clear that we are not referring to the 9th Infantry Division (Motorized), another subject altogether which needs separate and careful treatment in its own right. In what follows, we speak of pure infantry—infantry on foot, carrying its weapons on its backs.

Mechanized infantry shares these characteristics when it dismounts, airborne infantry when it has slipped out of its parachute harness, and air assault infantry after the delivering helicopters have departed.

But we plan to leave our light infantry on foot—in the forests, the buildings or the mountains—to fight it out. This kind of infantry is specifically designed for such operations. It does not leave the roads in the valley clogged with the vehicles it has left behind as it climbs into the hills (as in Korea). It does not depend for its main firepower on the guns of armored fighting vehicles which it, in turn, would be obliged to protect. It may be moved from time to time by helicopters into mountain and otherwise inaccessible positions, but it does not operate a vast armada of flying machines. It is, in short, very much like World War II airborne divisions once they found themselves on the ground.

Light infantry consists of soldiers on foot, carrying rifles, grenade launchers, machine guns, light antiarmor weapons, mortars, hand grenades, possibly mines, and always radios. In their pockets, pouches and rucksacks, they carry ammunition and life support equipment such as entrenching tools, food, water, ponchos, first aid kits and sleeping rolls.

These trained and hardened soldiers, individually and in small teams, move and dwell in the very small compartments of the micro-terrain. They walk, run, crawl, dig and employ their weapons in the deep nap of the earth. These terrain compartments are defined and limited by the range of direct vision (intervisibility). They can be relatively larger, as in clearings and along firebreaks, from mountain ridges or high buildings. They can be very small, as in the rooms, basements and attics of houses, in the spaces between trees and bushes and in the confines of rocky declivities in the sides of mountains.

In this kind of terrain, control is necessarily decentralized. The fighting takes place at team, squad and platoon level, most of it beyond the view and some of it beyond the knowledge of battalion and even company commanders. In no other form of combat does so much depend upon small unit leaders and aggressive and innovative responses to transient opportunities within the broadest interpretation of the mission at hand.

In his book *On to Berlin,* Lt. Gen. James M. Gavin, U.S. Army, retired, affords a classic view of light infantry operating magnificently in its own environment. Lt. Col. Ben Vandervoort's battalion of the 505th Parachute Infantry was fighting toward the key bridge over the lower Rhine in Nijmegen, The Netherlands, in cooperation with the tanks of the British Grenadier Guards.

> The tanks of the Grenadier Guards were very vulnerable in the city streets . . . Vandervoort's troops had to fight their way from building to building. . . . It was a new experience for the troopers, but they soon discovered that the best technique was to fight from rooftop to rooftop. . . . Later the veteran troopers told me . . . what they wanted to do . . . was to get as close . . . as they could . . . to fire down into the gun positions of the 88s and the foxholes of the Germans. . . . As a British officer of the Grenadier Guards later described it, "A jolly sight to see those paratroopers, hopping from rooftop to rooftop." . . . In the final all-out assault, they overran all the German positions . . . of the 500 Germans . . . south of the river . . . only 60 survived.

Light Infantry can maneuver offensively or defensively through kinds of terrain where no vehicle can or dares to go. It can disappear into such terrain and become invisible to the enemy in front and to sensors above. The grazing angles of the airborne radars do not reach into the nap of the earth and light infantrymen are poor reflectors.

Because the infantryman is almost completely vulnerable to enemy weapons, he has learned to survive by the continuous use of cover from fire and concealment from view. It is these passive measures upon which the survivability of the light infantry chiefly depends. Consider the skillful application of these techniques by our erstwhile opponents, the Vietcong and the North Vietnamese army.

Much of the utility of light infantry comes from the fact that it is a widely distributed, very high resolution surveillance, target acquisition and engagement system. By placing soldiers in every terrain compartment across its front, however small, the enemy cannot move without detection and engagement. It is not just the light weapons of the light infantry which are brought to bear; the infantry is the agent of all the firepower that can be summoned from the rear: artillery, mortars, rockets, missiles, attack helicopters and tactical air forces.

Thus, a large fraction of applied firepower need not be carried into the forward edge of the battle area on the backs of light infantry, but, nonetheless, these heavy systems must be present in the force and available in support of light infantry whenever they go into action.

At the end of World War II it occurred to me that, as an infantry battalion commander, one of my greatest contributions to the success of the venture was to move artillery observers to the next high point of ground from which they could dominate by heavy firepower all the terrain under their view.

And so it will always be that the light infantry, in addition to its own intrinsic fighting value, is also a primary means by which massive modern fire support can be brought to bear with precision and decisive effect on enemy forces encountered or flushed during aggressive light infantry operations.

We must not be carried too far by the following analogy but the light infantry soldier is, beyond doubt, the most versatile, advanced and effective combat "system" on the battlefield and will never be duplicated in mechanical or electrical form. If we ever came close, we could not afford such a mechanism.

Consider:

- In one package, the light infantry soldier provides an optical and aural sensor system (eyes and ears) tied into a central processor (the brain) with an incredible range of operating programs and almost infinite recoverable memory.
- The system can be rapidly programmed (through training) and loaded through a voice-recognition system. It is, thereafter, adaptive and self-reprogrammable.
- It can accept and apply mission-type instructions to infinitely variable terrain, conditions of visibility, size and composition of enemy force and enemy movements and actions.
- It can assess and select covered and concealed routes of advance into the enemy rear and onto his flanks.
- All this is mounted on a multi-flex chassis capable of negotiating every kind of terrain, including water obstacles, by self-propulsion.
- Super robotic arms, hands and fingers with infinite degrees of freedom couple the control processor to weapons and communication devices.
- This remarkable fighting system includes automatic and continuous position location, plus situation analysis and reporting, with a large, flexible (even entertaining) vocabulary.

- The "system" performs target detection, identification, acquisition, munition and weapon selection, engagement, damage assessment and reengagement as indicated by target condition.

The light infantry soldier offers what the gurus of artificial intelligence only dream about, wistfully, and are destined never to even remotely approach.

Light infantry is a unique, indispensable element of a balanced fighting force. In its preferred environment, it is the maneuver force of choice. There will always be a strong temptation, however, to "fix" the light infantry by beefing it up. Each of its virtues in light infantry terrain will be regarded as a deficiency in "universal" terrain. The organizational mechanics will inevitably try to give it mobility, survivability and more lethality by loading it up with heavy weapons, vehicles and even armor. The danger then becomes one of creating an impotent hybrid, too encumbered to be mobile in the forest and too vulnerable to survive in the open.

This is not to say that the light infantry can do it all alone. It should not be deployed without additional fire support which need not accompany it into the forests or mountains. But it must be able to support light infantry wherever it may be and be able to exploit its target acquiring and target forming characteristics.

There is no controversy and little doubt that light infantry will be required in many of the contingency operations which may arise, particularly in the less-developed regions of the world—areas characterized by tropical jungles, forested mountains and swampy deltas.

Mountains remind me of a recent news item to the effect that the 10th Mountain Division (Light Infantry) was considering recourse to mules to pack its heavier loads. That is one way to do it, but a better one by far is by helicopter.

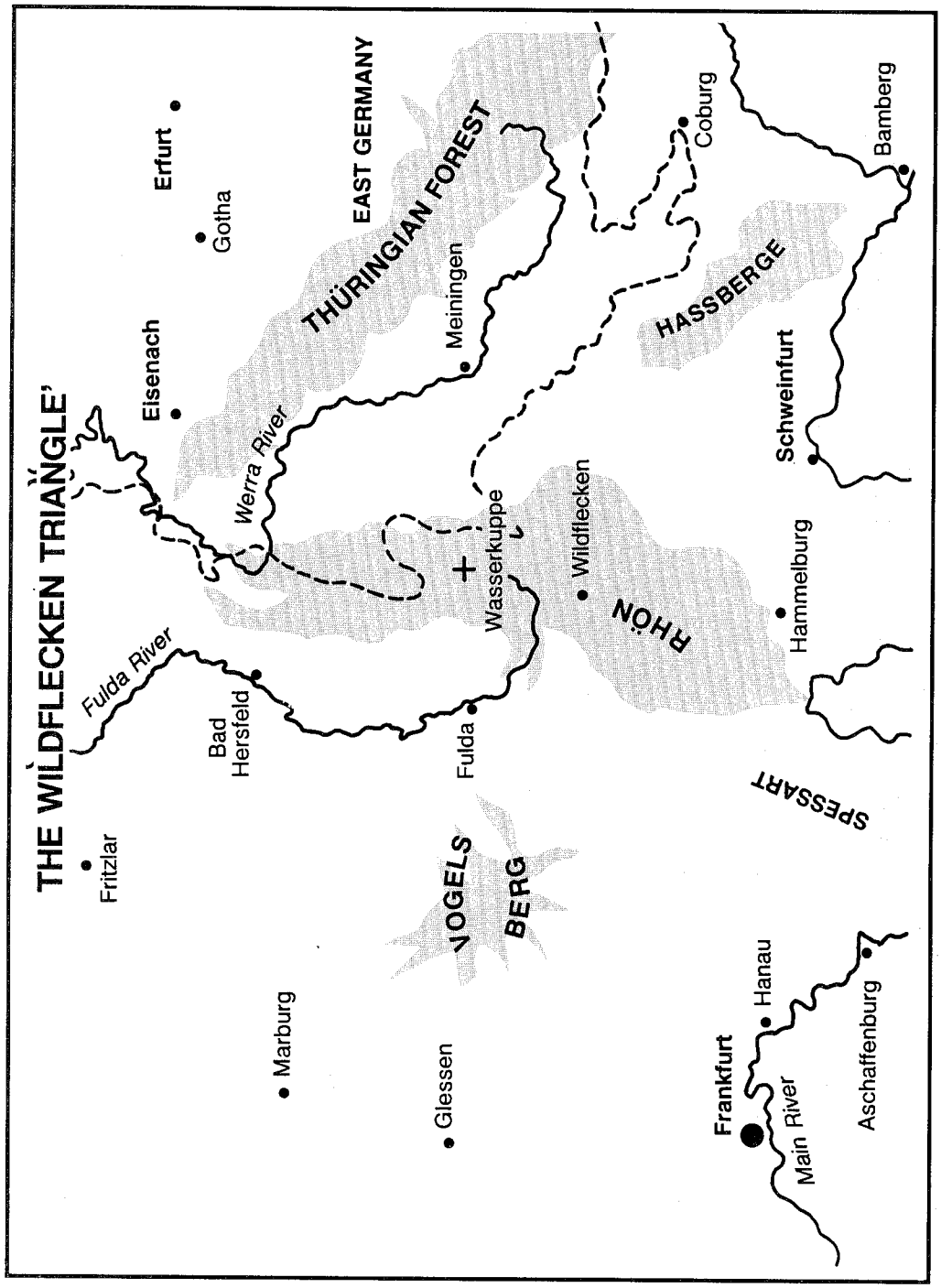
In fact, the 101st Airborne Division (Air Assault), as it is now organized, is a nearly perfect mountain division. It could deploy into, say, the Zagros Mountains along the Persian Gulf (should that be necessary) by lifting light infantry with heavy antitank guided missiles (ATGMs) to the high ridges overlooking the few routes which snake their ways through the valleys below. It would be virtually impossible for a mechanized army to dislodge such a force.

What about Europe? Gen. Frederick J. Kroesen, when serving first as VII Corps commander and later as U.S. Army, Europe, and NATO's Central Army Group commander, wanted more infantry; he saw needs for it almost everywhere. German Gen. Uhle Wetter made a strong case for more infantry in the forested and urban terrain of West Germany. Recently, the U.S. Army has canvassed its current NATO commanders on the subject and it is reported that they, too, are interested in light infantry divisions, or parts of divisions, in the U.S. force in Europe.

From an operational standpoint, there is a marvelous opportunity to use up to two light divisions smack in the center of the U.S. sector. Between V and VII Corps lies an awkward piece of terrain which is in the form of a giant wedge or triangle.

The apex is on the zonal boundary beyond Wildflecken. To the south and west stretch the high hills, deep ravines and thick forests of the Hohe Rhön and the Spessart. The base of the triangle runs along the Main river from Würzburg to Hanau. This nearly equilateral wedge of terrain is about 75 kilometers on a side and it acts as a huge gusset in the fabric of the U.S. defensive sector which extends north in V Corps and east in VII Corps.

If they could, both corps would love to wish this terrain away; it is an embarrassment to a highly mechanized force. Neither corps wishes, or can afford, to invest its very mobile armored or mechanized divisions in such restricted terrain. V Corps will be drawn northward into the battle of the Fulda Gap and the VII Corps eastward into the Meiningen-Würzburg corridor.


THE WILDFLECKEN TRIANGLE'
Fritzlar
Fulda River
Bad Hersfeld
Eisenach
Erfurt
Gotha
Werra River
EAST GERMANY
THÜRINGIAN FOREST
Meiningen
Coburg
Bamberg
HASSBERGE
Schweinfurt
Marburg
Giessen
VOGELS BERG
Fulda
Wasserkuppe
Wildflecken
RHÖN
Hammelburg
SPESSART
Frankfurt
Hanau
Main River
Aschaffenburg

So why not deliver a light infantry corps to infest and operate in and from this terrain? It would be nearly impossible for Soviet mechanized forces to dislodge it with any reasonable diversion of effort.

Under these circumstances, the Soviet commander would most likely ignore this terrain—stick to the high-speed routes on either flank, do battle with our heavy divisions in the open and do his best to press on to his assigned objectives.

But can NATO take the same view? On the Hanau-Würzburg line, the base of the triangle represents nearly 30 percent of the U.S. battle line. Furthermore, this terrain, although difficult, is by no means impassable, even for armor. Recall that in World War II a task force of 4th Armored Division made a fast transit of this area from Aschaffenburg to Hammelburg in an ill-fated effort to free U.S. prisoners. They did not make it back because they were trapped in unfriendly terrain. That same terrain today is an optimum environment for light infantry operations.

Within the protected confines of this enormous hedgehog, positioned on the flanks of two main invasion routes, the defending army could locate long-range pocket and missile firing positions, surveillance and target acquisition bases and special operations raiding forces. Offensive operation by light infantry could be mounted against the flanks and rear of Warsaw Pact forces moving on adjacent routes.

The area affords a protected penetration route for attack aircraft and helicopters working on the rear echelons of the opposing force. It provides a stable anchor for the mobile operations of our armored forces on either flank. In short, light infantry could convert the Wildflecken Triangle from a liability to an asset.

The huge urban coagulations, for example, at Munich, Stuttgart, Frankfurt and in the Ruhr also could harbor light infantry. But surely these politically sensitive requirements would be met by the reserves and territorial forces of our NATO allies.

In Europe or in Southwest Asia against modern armor, it is always possible for light infantry to construct strong points or other fortified positions behind mines and within wire, given time and circumstances. Such was the typical employment of infantry on the North African desert. When, as with the Germans in June 1942 at Bir Hacheim (the southern anchor of the British Gazala line), the armor felt it necessary to attack such defenses frontally, it paid a heavy price. But too often the infantry was left behind to be rounded up by the mobile force which achieved an operational victory. Remember, too, the more recent fate of the Bar-Lev line along the Suez Canal in October 1973. It is brave but sad to use light infantry in this way.

Thus far, I have tried to convince the reader that light infantry is particularly well suited for employment in closed and obstructive terrain, and that it can maneuver aggressively in there when heavier forces are greatly inhibited or totally blocked.

The use of light infantry in World War II by the Germans as a screening and shaping force leads some to consider such forces as primarily defensive. In the open steppes or desert, that opinion tends to be borne out but it is clearly not true in light infantry terrain. Such terrain, in fact, affords a more congenial environment for the attack than for the defense. This is because the compartmentation of the terrain permits the attacker (light infantry) to maneuver out of view and to concentrate undetected. The defense, on the other hand, is obliged to occupy all of the terrain compartments—only light infantry can do so—in order to maintain even surveillance across the front. Therefore, the defense can never be very strong at any one point and must rely on the massing of heavy firepower delivered from the distant rear as a means of rapid

counterconcentration. In these cases, the infantry line is a gigantic sensor array for which no viable mechanical substitute has ever been found.

In the attack, light infantry is even more effective on its own account because it can move by stealth, at night, or through covered and concealed routes within the micro-terrain into the enemy positions or into his rear areas. Elite light infantry operating in this manner is a terrifying weapon.

An attractive option often open and often exploited by seasoned light infantry in World War II was to find its way by concealed routes into the enemy's rear, usually at night. By occupying a controlling piece of terrain, the infantry then called on heavy fire support to assist in destroying the enemy force sent to dislodge it. It is unlikely that this formula has lost its effectiveness through age.

In the set of new light divisions, the Army has a force which is strategically mobile and tactically versatile in its preferred terrain. The challenge to Army commanders will be to integrate this new capability into successful "operations." The operational art which is now being revived and strengthened in an Army which has been tactically preoccupied since Korea is the art of conducting successful campaigns using high performance tactical units, within a strategy for winning wars.

In certain contingencies, light infantry might comprise the chief component of the force. In Southwest Asia, light infantry would more likely be a key element; in NATO, it would be a useful addition.

In all these cases, the rapid strategic deployment of light divisions could be important as a token of U.S. resolve and intentions. Upon arrival, however, their combat performance is the paramount issue. In this discussion, there is an implicit assumption that light infantry can destroy enemy armor with the weapons in hand—if not at long range, then surely in close combat. Unfortunately, this presupposition is under challenge.

In the last 15 or so years, armor technology has thrown off its dependence on rolled homogeneous steel plate and has exploded to new and higher levels of effectiveness. Spaced, laminated and even more exotic concepts for armor protection have reached a point where many of the smaller antiarmor weapons have been rendered largely ineffective, at least against the frontal armor and turrets of the most modern tanks. This fact has profound implications for light infantry which is so heavily dependent on those same smaller weapons.

The largest tank guns and the heaviest ATGMs can penetrate the most advanced armor in the frontal aspect. But these weapons are too large and heavy to accompany light infantry into its favored terrain so, generally, these larger weapons will be confined to the force which rides to work.

Correspondingly, they will be found with infantry which more often operates in areas of good visibility. Long-range fields of fire favor ATGMs because of their ability to engage tanks beyond the effective range of the tank's guns. Except in the mountains, opportunities for long-range shots are rarely found in light infantry terrain.

The Dragon was developed in an effort to bring the effectiveness of the ATGM to the infantry which walks to battle, jumps, lands from helicopters or dismounts from vehicles. Given its weight and bulk, its distinctive signature, long time of flight, slow rate of fire and relatively high profile—coupled with a range well within the effectiveness envelope of the rapid firing tank gun—the Dragon demands the full measure of devotion from its gunners. Now the newest armor moves Dragon into the marginal category in terms of frontal penetration.

Efforts to replace Dragon have been unsuccessful. "Rattler" aborted after industry proposals had been received. "Awesome," a new concept (from AAWS—advanced antitank weapon system), is just now moving into the front end of the development process. It is hoped that this effort will move rapidly to fill a pressing need.

At the low end of the spectrum, the arena in which the light antiarmor weapon (LAW) operates, high technology armor has gained at least a temporary upper hand.

Lest we forget what this means to light infantry, Gen. Gavin's views were clear after his experiences in Sicily as the commander of the 505th Parachute Infantry Regiment. In his book, *On to Berlin,* he notes:

> Ironically, after many lives were lost, in mid-August 1943 we received a War Department intelligence bulletin telling us that the bazooka [2.36 inch] would not penetrate the frontplate of the Tiger tank—as though we didn't know it already. More sadly, we still had not obtained a larger bazooka by the time Gen. [Douglas] MacArthur sent the first troops to Korea seven years later to meet the Soviet T-34 tanks in the summer of 1950.

T. R. Fehrenbach in his book, *This Kind of War*, tells us what happened seven years later:

> Task Force Smith was dug in along the main highway between Suwon and Osan. . . . At 700 yards, both recoilless rifles (75-mm) slammed at the tanks. Round after round burst against the T-34 turrets with no apparent effect. . . . Lt. Ollie Connor, watching, grabbed a bazooka and ran down to the ditch along side the road. Steadying the 2.36-inch rocket launcher on the nearest tank, only 15 yards away, Connor let fly. The small shaped charge burned out against the thick Russian armor without penetrating. Connor fired again, this time at the rear of the tank where the armor protection was supposed to be thinnest. He fired 22 rockets, none of which did any damage. . . . The tanks . . . continued down the road.

Ten years ago, the Army undertook to replace the current LAW with a new and better weapon called the Viper. The Viper program has been discontinued. In trying to meet the range, time of flight and penetration specifications, within the weight limits for light infantry use and at a cost which would allow proliferation of the new weapon throughout the force, the program came apart.

Now the Army is completing an evaluation of other alternatives, including a number of foreign models. The Swedish AT-4 is regarded favorably for troops who have a vehicle to help carry it around. But the discouraging fact is that presently there is no hand-carried/shoulder-fired individual antiarmor weapon anywhere in the world which can defeat modern armor head-on at a weight and size appropriate for light infantry operations.

Such is the low state to which the Army has been brought by the ascendancy of armor technology. Such is the chief problem which faces the light infantry.

What is the solution?

First, it should be very clear just how these valuable troops should be employed. In the best of all worlds, light infantry would be used:

- Against comparably equipped light forces in any kind of terrain.
- Against armored forces, in general, only in light infantry terrain.
- Against the most modern enemy armor only in that part of the light infantry terrain which is not physically negotiable by that armor.

But the reader will be uncomfortable with such rules and assumptions; the world is a disorderly place which does not always submit to precise formulae. In emergencies, decisions to send U.S. forces into combat are not made by authorities who are aware of such technical problems; President Harry S. Truman was not thinking about 2.36-inch rocket launchers when he ordered U.S. troops into Korea.

It is easy to imagine a scenario in which the United States goes to war in some distant part of the world in which the exigencies of the situation cause light infantry to be exposed to conditions which are unfavorable for such troops.

There are ample precedents for such expectations; however, we are aware of the fact that there have been times when the troops managed to succeed against all odds and all tactical logic. This is at once the glory of the fighting troops and the shame of the weapons development community. The men who equipped the U.S. Army with the 2.36-inch bazooka were not with Gen. Gavin in Sicily. He bailed them out with the only currency he had, the lives of his brave troops.

When this same 82nd Airborne Division was thrown into the Battle of the Bulge on the critical northern flank of the German penetration in December 1944, the light infantry of the 504th Parachute Infantry Regiment under the legendary Col. Reuben Tucker again bailed out the high command. As Gen. Gavin described it in *On to Berlin*:

> Shortly after daylight on December 20, I met Col. Reuben Tucker. . . . He told me . . . that approximately 125 [German] vehicles, including 30 tanks, had moved . . . in the direction of Cheneux. . . . He was anxious to go after them without delay. Any ordinary infantry regiment would want at least a battalion of tanks in support before it attacked, but Tucker's idea was to attack the Germans and take their armor away from them. Besides, he had been carrying with him about a truckload of *panzerfausts* he had captured from the Germans in Holland, and they were to prove to be the paratroopers' best antitank weapon. . . .
>
> So with his German *panzerfausts* and his superb infantry, Tucker moved at once to attack the Panzer forces in Cheneux. . . . Heavy fighting took place . . . the German firepower was impressive. They were using a great many 20-mm flak weapons.
>
> Col. Tucker had deployed the 1st Battalion of the 504th . . . and as darkness descended . . . Companies B and C were under tremendous fire from the village. . . . Tucker ordered . . . a night attack. . . . His 3rd Battalion . . . made a wide flanking movement . . . cut off Germans in the town and completely destroyed their command. . . . Tucker lost 225 dead and wounded. . . . Tucker captured 14 flak wagons and a battery of 105 howitzers as well as many vehicles. . . . The next day they pointed out they were now the 504th Parachute Armored Regiment.

It is just this kind of wild and inspired action which causes commanders to accept without complaint almost any mission which is served up in the heat of battle. But weapons development decisions are not made in that environment nor are the tactics those weapons suggest appropriately left to chance. We are obliged to think through this problem now and move with speed to resolve it; otherwise, we will be faced, inevitably, with a rerun of Task Force Smith.

If it is true that the laws of physics and the state of current technology preclude the development of a shoulder-fired weapon that can defeat enemy armor head-on as it approaches the infantry position, then we must find a weapon which at least will defeat enemy armor should it penetrate into light infantry positions.

Such a weapon and the troops trained to employ it could deny many of the urban and forested areas of West Germany and most of the villages and towns to the opposing force. Up-to-date maps show this to represent more than half of all the terrain which lies before the armored and mechanized forces of the Warsaw Pact. This combination of facts draws us to the conclusion that the employment concept needs to be adjusted and the performance specifications thus relaxed.

An enemy tank which makes the mistake of penetrating terrain infested with light infantry can be engaged from all aspects at very short ranges. That should make the technical problem easier. No large weight need be allocated to a large rocket motor to achieve long range and high velocity.

Thus, the warhead could be larger and the rocket could be smaller, as in the World War II *panzerfaust* or even the Soviet RPG. If that avenue does not lead to success, then other technical solutions must be explored quickly.

But, above all, the weapon must be clearly effective. It takes intrepid soldiers to employ such weapons, and intrepid soldiers will be hard to find if their audacity is seen to be most often rewarded by failure. A few examples like that of Lt. Ollie Connor in Korea will dry up the pool of intrepidity overnight.

Furthermore, this weapon must be maneuverable in the hands of a single tank-hunting soldier who may find it necessary to crawl, run, jump or hide. He must be able to fire down into the street below from a window or roof. The minimum range could be as short as ten yards. This is the weapon American ingenuity must now produce.

In 1950, our eyes had been on the atomic bomb, the strategic air command, on the unlikelihood of any more wars fought by light infantry. We were nearly done in by a rusty T-34 tank driven by a North Korean recruit.

Today our eyes are fixed on outer space, on an export war between machines; scientists, not soldiers, are thought to be required. Watch out, Ollie Connor!

With a program for five light divisions (four active and one National Guard), the Army has made a reasonable and timely organizational move. With the 6th Division deeply embedded in its Alaskan duties, Gen. Wickham will dispose of just three new light divisions (7th, 10th, 25th) in the strategically mobile and immediately ready force. Combined with the two "special" divisions (82nd and 101st) there will be five Army light infantry divisions out of an active force of 18. Considering the open-ended and far-flung exposure of this nation, its allies and interests, it is hard to argue that this is an extravagant number.

If the utility of one or two light divisions in NATO is accepted, then the program makes eminent sense—sense, that is, when the antiarmor problem is solved, sense insofar as the special conditions which favor the use of such forces are thoroughly understood, and sense to the extent that light divisions are seen as just one important element of a balanced force.